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A Land of Opportunities: Foreign Engineers in the Ottoman Empire

Abstract: Hundreds of foreign engineers worked in the vast lands of the Ottoman Empire from the eighteenth to the early twentieth century. These engineers and the works they carried out are worth exploring from the perspective of the circulation of experts in a global context. A closer look at the patterns of their employment contributes to developing a better understanding of the formation of engineering as a profession in the Ottoman context. This article studies the motives of foreign engineers for moving to the Ottoman lands, the projects they were involved in, their countries of origin and their relationships with local engineers. We argue that the presence of foreign engineers in the Ottoman lands was beneficial to all parties involved. Foreign engineers obtained prestigious jobs and brought with them access to a kind of expertise that distinguished them from their less mobile colleagues. The Ottoman Empire in turn benefited from their work and expertise at many different levels of administration, in public works, in upgrading infrastructure and in education.

Foreigners had served Ottoman sultans since the early years of the Empire. There was nothing exceptional in that; anyone whose skills were considered useful could establish a relationship of personal loyalty with the sovereign, independently of his or her origins. This does not mean that being part of a specific ethnic or religious group was of no importance. While being non-Muslim could be a barrier to accessing many posts and ranks (particularly in the armed forces), certain groups were nevertheless associated with desirable knowledge and skills, and their members were sought after and their services prized for that reason.

In the eighteenth century, the idea that Europe (*Avrupa*) was gaining important advantage over the Ottomans in specific strategic areas—such as arts and sciences linked to warfare (e.g., military drills, artillery, fortification, shipbuilding and cartography)—gained ground among the Ottoman ruling elites. This had major repercussions for the practice of employing foreigners. People coming from European countries became associated with this superior knowledge and skills, and were thus offered advantageous conditions of service. At the same time, the notion of European superiority in terms of knowledge and skills was

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becoming deeply rooted in the minds of the Europeans themselves, which made them more self-confident, more demanding and less willing to fully shift their allegiance and sense of belonging from a European sovereign and country to the Ottoman ruler and lands. These trends subsequently shaped patterns of recruitment and of service (Ágoston 2005; Aksan 2002; Kaçar 1996).

As in the past, foreign individuals, including technicians and military experts, continued to offer their skills to the sultan—sometimes moved by the need to seek refuge from a dangerous situation they faced in their own country, or from shameful personal circumstances. In these cases, conversions to Islam were still common for those who wished to integrate into the Ottoman military structures—although since the Hungarian baron Ferenc Tóth (François de Tott) undertook a partial reform of Ottoman military training in the 1770s, many foreign experts were commissioned to carry out military and naval tasks without the requirement of conversion. This trend was further strengthened when official inter-governmental collaboration was established between France and the Ottoman Empire, and Louis XVI sent several groups of expert officers and craftsmen to improve the performance of the Ottoman navy and armies by introducing new shipbuilding techniques, reshaping and enhancing military education and training, and innovations in weapon production, artillery and fortifications. This collaboration continued under the French revolutionary government and, later, several other countries followed France's example and put their experts at the sultan's disposal (Kaçar 1996; Firges 2014). In their turn, the Ottoman rulers (as well as their highly autonomous Egyptian vassals) began to send students, apprentices and experts of all ethno-religious origins to foreign—mostly European—schools, workshops and military establishments, as did Ottoman families. Ottoman Christian elites (particularly the Greeks, and some Jewish groups—mainly those with ties to Italian lands) had always sent their sons to European universities, but by the second half of the nineteenth century, this practice was being adopted by Ottomans of all ethno-religious groups. Several sons of powerful Ottoman pashas were educated in prestigious engineering schools in Europe and went on to actually work as engineers: this was the case of Mehmed Refik, Yusuf Razi and Kamuran Sirri.

Employing foreign experts via intergovernmental collaboration had important advantages, the most significant being that, unlike in the case of individual 'fortune-seekers'—who tended to exaggerate their knowledge and skills, or to fashion themselves as experts in strategic fields despite their limited experience—the expertise of the men sent by foreign governments was guaranteed. Among the disadvantages of this practice was the fact that these foreign experts gave detailed reports on Ottoman military issues (including maps of strategic places and plans of fortifications) to their governments—and their missions

were sometimes abruptly interrupted when their country switched its alliances and/or entered in war with the Ottoman Empire. This type of intergovernmental collaboration continued until the end of the Ottoman Empire (and beyond): high-ranking officials of the French corps of *ponts et chaussées* engineers were employed as technical advisors at the Ottoman ministry of Public Works; officers of the British Royal Navy served in the Ottoman Navy for many years; and German and Austrian officers not only trained Ottoman officers and advised Ottoman officials, but even came to command Ottoman troops (Martykánová 2016–2017; Soydemir 2007; Ortaylı 1981). Sometimes, the nationals of small states were explicitly preferred, such as when Belgian general Henri Alexis Brialmont was commissioned in 1892 by Ottoman imperial authorities to draft plans for an improvement of the fortifications of the Straits (Alloul 2017, pp. 21–22).

Occasionally, foreign engineers might have found themselves in the midst of highly delicate political issues. Their tasks could create a conflict of political and economic interests involving different parties, including their own countries. Between 1845 and 1858, the region of Mount Lebanon experienced severe political turmoil. The region's social structures began to dissolve due to multi-directional struggles, including ethnic and religious conflicts, center versus province rivalry, and inter-communal struggles and tensions between feudal lords and villagers. In addition to the Ottoman administration, France, the British Empire, Austria, Russia and Prussia were actively involved in the region. The Ottoman government had been searching for solutions to stabilize the region, to provide security for its people and also to collect taxes by negotiating with local forces and their 'protector' countries. In these circumstances, with the expectation of solving political problems, the government created a commission to make a cadastral survey of the region that would lead to a more equitable distribution of taxes among subjects. Two Prussian engineers were appointed to carry out a cadastral survey of the region. Nonetheless, different actors and groups who did not agree with the project or with the way it was supposed to be carried out fiercely opposed the engineers' presence in the region. Even the Prussian consul was annoyed with the Ottoman government for placing Prussian subjects under the command of the Ottoman governor, and he made his discomfort clear to the engineers. The Ottoman authorities made an effort to minimize these tensions by appointing local men to escort the Prussian surveyors while they were making their reconnaissance. In spite of these measures, the lives of the two foreign engineers were threatened many times during the course of their duty (Farah 2000, pp. 477–487).

With the growing integration of the Ottoman Empire into the European concert of powers, and increasing contacts between the sultan's subjects on the one hand, and nationals of different European countries on the other hand, the Otto-

mans often took the initiative and recruited skilled persons themselves. Such an initiative played a pivotal role in the story of the Polish engineer ‘Vankovitch’, recorded by British Army intelligence officer Fred Burnaby (1842–1885). This Pole, who was to become a chief engineer in several provinces of the Ottoman Empire, was most probably Teodor Wańkowicz, born in 1846 into a Polish noble family from a region near Minsk in today’s Belarus, and also known as Teodor Bej (Bey). Wańkowicz, who was a subject of the tsar of Russia, graduated as a military engineer from the Military College of St. Petersburg. When the Polish insurrection against Russian rule (the January Uprising of 1863–1864) had broken out, he joined the rebels. He fought against Russia as a commander of a group of insurgents. After the revolt was suppressed, Wańkowicz escaped and, after a troublesome journey, he found himself in Istanbul, penniless. To make his own living, he started to work on the construction of roads. The engineer who supervised the work noticed that Wańkowicz knew as much about road-building as did he himself. Thus, he promoted him to assistant-engineer. His skills took Wańkowicz (or Teodor Bey) to provinces such as Yanya (Ioannina) in the Ottoman Balkans, and Yozgat in Asia Minor, where he worked in the service of the Ottoman state as a chief engineer of the province (Burnaby 1877, pp. 185–186; Konstantynowicz 2013).

In turn, foreign engineers spotted and trained local talented men. During his employment as chief engineer at the Ottoman Imperial Arsenal, a British engineer named Shanks was assisted by local mechanical engineer Ahmed Besim. After Shanks’s resignation from the post, Ahmed Besim was appointed as his replacement (Tekeli / İlkin 2010, p.143). Émile Lacoine, a French engineer who enjoyed a long and fruitful professional career in the Ottoman administration of Posts and Telegraphs, set his eyes on the young Salih Zeki, a talented technician who had been educated in the *Darişşafaka*—a state-funded school for orphans that was known for its good technical and scientific curriculum. Lacoine arranged for Salih Zeki to be sent to study in France and, after he returned to Constantinople, the young man went on to have a remarkable career as a mathematician, including teaching posts at prestigious state schools (Günergun 2005, pp.117–118).

The government or particular institutions sometimes asked the Ottoman embassy in a specific country to contact and recruit experts that were needed. In other cases, the Ottomans who (had) lived, studied or travelled abroad, approached the candidates and proposed to them the idea of working in the Empire, be it for the government, for a public institution or for a private company. Thus, for example, when the above-mentioned Ottoman electrical engineer Mehmed Refik, who had studied in the *Institute de Montefiore* in Liège, became director of the Civil Engineering School (*Hendese-i Mülkiye Mektebi*, later *Mühen-*

dis Mektebi), he recruited Belgian engineers to teach in this Ottoman public institution (Akbaş 2007–2008, pp. 101–119).

Personal recommendations and networking proved to be an important force shaping individual professional trajectories, and an efficient means of recruitment. The Austrian engineer and expert in hydraulics Philipp Forchheimer (1852–1933) obtained his diploma in engineering at the Technical *Hochschule* of Zürich in Switzerland and received his *Habilitation* in the Prussian city of Aachen. In 1874, he worked on the construction of the railway from Rakovník to Protivín in Bohemia, which was then part of the Austrian Empire. We do not know how exactly he came to teach the ‘sciences of Public Works’ at the Civil Engineering School in Constantinople in 1891–1892, but he soon returned to Aachen as a professor and subsequently taught at the Technical *Hochschule* of Graz, where he became a rector in 1896/7. In 1913, he was back in Constantinople: the Ottoman authorities appointed him a *ders nazırı*, or director in charge of the lectures (academic director) of the School of Engineers (*Mühendis Mektebi*); that is, the reformed Civil Engineering School where he had taught more than twenty years before. Besides his administrative tasks, he lectured on hydraulics, canals, bridges and similar subjects. Forchheimer’s motivations for his professional involvement in the Ottoman Empire are unknown, but we know that, at least according to his Ottoman students and colleagues, he felt comfortable in Constantinople and had a good relationship with local staff and students. Moreover, he might have been attracted by the opportunity to pursue his interest in Byzantine hydraulics and architecture: he is an author, together with the art historian Josef Strzygowski (later infamous for his Nazi activism), of the book *Die Byzantinischen Wasserbehälter von Konstantinopel*, published in Vienna in 1893, soon after Forchheimer returned from his first teaching engagement in the Ottoman Empire (Kozeny 1961, pp. 295–296; Österreichische Akademie der Wissenschaften 1957, p. 336; Uluçay / Kartekin 1958).

During the Great War, when Austria and the Ottoman Empire were allies, Forchheimer contacted another Austrian engineer, Karl Terzaghi, and asked him to join him. Terzaghi, born in 1883 in Prague, had studied at the Technical *Hochschule* of Graz—the school where Forchheimer had taught and served as rector. Terzaghi accepted Forchheimer’s offer, probably using it as an opportunity to escape the meat-grinder of the Great War. In 1915, he became a professor of the ‘tolerance of railway instruments’ and of the ‘principles of civil engineering’ at the School of Engineers in Constantinople, training some of the members of what was to become the first generation of civil engineers of the Turkish Repub-

lic.¹ In the following decades, this young man was to become a famous engineer who worked and taught on several continents (he became a lecturer at Harvard University in 1938), and is considered the father of soil mechanics (Goodman 1999). Terzaghi's mentor Philipp Forchheimer did not seek talent only in Europe, though. During his appointment as academic director at the School of Engineers, he recruited an Ottoman Muslim, Salih Murad (who later adopted the surname Uzdilek), who taught at the Ottoman Naval Academy, to teach physics to his engineering students (Uluçay / Kartekin 1958).

As we have already observed in the case of Teodor Wańkiewicz, the willingness of Ottoman authorities to grant exile to refugees from European countries had collateral benefits for Ottoman engineering. In such cases, the Ottomans did not have to go and seek skilled men in Europe; these experts came to the sultan's domains on their own, thirsting for an opportunity to earn their living by making use of their expert knowledge and skills. There were several major waves of refugees in the long nineteenth century that brought in useful expertise, the first of which was linked to the French Revolution, the Napoleonic wars and the Restoration of absolutist regimes. The partition of Poland and the uprisings that followed from time to time throughout the following century also created several refugee waves, as did the revolutionary wave of 1848 and the struggle for Italian unification. Italians, Poles and Hungarians came in noteworthy numbers and were often willing to fully commit to the Ottoman Empire and become Ottoman subjects. This was the case, for instance, of a Polish engineer called Franciszek Sokulski, who was a distinguished member of the Polish émigré community that gathered and organized themselves in the early 1850s in the city of Shumla in the Ottoman Balkans. Realizing that he had little chance of returning back to his homeland, Sokulski decided to permanently settle in the Ottoman Empire. Apparently, he discussed this issue with Omar (or Ömer) Pasha (1806–1871), a high-ranking and successful Ottoman military man who was himself of Serbian origin, born as Mihajlo Latas in an Orthodox Christian family in the Austrian Empire—though in his case, his exile to the Ottoman lands (and subsequent conversion to Islam) was motivated by embezzlement charges, rather than by the sort of noble political reasons that most probably caused the flight of Franciszek Sokulski. Omar Pasha encouraged Sokulski to apply to the Ottoman grand vizier for a job as a civil (*ponts-et-chaussées*) engineer, building roads in the Ottoman provinces of the Balkan Peninsula. It

¹ The term 'civil engineer' is highly polysemic. In this article, we do not use it in the way *ingénieur civil* is generally used in French to denote an engineer working in the private sector, but rather in the sense of the Turkish *inşaat mühendisi*, the French *ingénieur de ponts-et-chaussées* or the Spanish *ingeniero de caminos*.

seems that he finally achieved his aim and was even able to retire—still a Catholic—with a state pension, as an engineer of a convincingly similar name appears in Ottoman documents during the several following decades (Martykánová 2010, p. 169). In this context, it is no surprise that their Ottoman peers and students cherished the memory of these exiles, particularly of the Poles.² Unlike their French, British or German colleagues, these engineers did not benefit from the backing of a great power with strategic interests in the Ottoman lands, nor had they their national companies operating in the Ottoman Empire and willing to systematically discriminate in their favor.

In most cases, foreign engineers in the service of the sultan were better paid than their local counterparts. Their term of employment was extended annually, or for longer periods if the agreement proved mutually beneficial. The expansion and consolidation of the administrative apparatus in charge of public works broadened and stabilized the career opportunities for both Ottoman and foreign engineers, as there existed no principle of national exclusivity that would establish Ottoman nationality as a requirement for all Ottoman public employees. Thus, for example, Italian engineer Luigi Storari was commissioned by the Ottoman government to work on specific tasks in different cities of the Empire, and ended up appointed to a permanent post as a specialist in cartography and measurements in the Direction of Buildings (*ebniye idaresi*) of the newly founded municipal government of Istanbul.³ However, the extension of service over decades might not have been so advantageous for foreign engineers, because in comparison to a local citizen it was often more difficult for foreign subjects to obtain the right to a retirement pension from the Ottoman government. Thus, for instance, British engineer Frederick Taylor worked in various industrial facilities of the state from 1833 on, only to become unemployed after 23 years of service and denied a retirement pension (Özbay / Bülbül 2009, p. 209).

One should not suppose that all initiatives to employ engineers came from officials of the central government. The central administration received demands for engineers from almost all regions of the Empire. Those engineers were sought for major and minor projects in cities, towns and villages. For the period between

² For such an acknowledgment, see the speech on the anniversary of the School of Engineers, delivered by its director Sami Bey on 20 November 1920. It is reproduced in full in: Uluçay / Karatekin 1958, pp. 637–639.

³ State Archives of the Prime Ministry of the Republic of Turkey (BOA): A.AMD, file 68, sheet 13, 1855/6; A.DVN, file 141, sheet 77, 1855/6; A.VN.MHM, file 28, sheet 4, 1858/9; A.MKT.MHM, file 139, sheet 11, 1858/9; A.MKT.NZD, file 178, sheet 31, 1855/6; A.MKT.NZD, file 377, sheet 35, 1861/2; A.MKT.NZD, file 350, sheet 82, 1860/1; A.MKT.NZD, file 351, sheet 28, 1860/1; I.DH, file 395, sheet 26165, 1857/8; I.DH, file 410, sheet 27159, 1858/9; I.DH, file 430, sheet 28443, 1858/9.

1854/55 and 1864/65, we have identified ninety-five projects for which engineers were requested in provinces and towns. In fact, the real number may be much higher, as our analysis was limited to the documents included in the online catalogue of the Prime Ministry Ottoman Archives. These engineers were employed in short-term works, upon completion of which they were immediately employed in another task. In case of an emergency, engineers could even be taken away from their posts and sent to another region of the Empire, leaving their current work unfinished. The existence and frequency of such demands points to the growing consolidation of the figure of the engineer in the social imagination of the ruling elites. The need for technical expertise was becoming widely acknowledged, and the social legitimacy of engineers expanded drastically. In this context, the authorities were in desperate need of experts: they tried to tackle this need by employing both Ottoman and foreign engineers.

For example, for the period between 1854/55 and 1864/65, we have identified at least 47 foreign engineers who were appointed by the Ottoman authorities to work on different civil projects, in state institutions, or for provincial and local administrations. Bearing in mind that this number does not include all of the foreign engineers who worked in the Empire at that time, we may nevertheless affirm that these engineers came mainly from Great Britain, France, Austria and Italian states. Besides other tasks, they were employed mainly for the construction of roads, the installation of telegraph lines, for mining, the construction of railways and for other tasks (including the amelioration of rivers, lakes and marshes, map-making, the construction of ports, docks and lighthouses, the refurbishing of urban areas destroyed by fire, the construction of buildings, etc.). The conditions of their employment varied from temporally limited contracts to a full integration into the Ottoman administration.

The growing presence of foreigners—be they recruited individually or via inter-governmental collaboration—at all levels of the Ottoman administration shaped and molded bureaucratic practice. One of the most obvious manifestations of the impact of their presence was that French became one of the languages of official communication, along with Ottoman Turkish. Many institutions, bureaus and departments, as well as territorial administration schemes, were inspired by European institutions and arrangements—but rarely were they an exact copy of a foreign model. Rather, foreign experts and Ottomans who had become acquainted with specific foreign establishments and practices, proposed, created and implemented institutions and arrangements that resembled what they knew from abroad, but included *ad hoc* adaptations to local circumstances and solutions to specific challenges, and often integrated local administrative and institutional traditions and routines. Foreign experts—even the most powerful and influential ones—could not create, reform and redesign the Otto-

man military forces and institutions of government at their whim; they had to get support and funding from Ottoman dignitaries and keep it long enough for their innovations and reforms to take root. Case studies show that creating working relationships and alliances with their local peers, including immediate superiors as well as junior colleagues or students, was often the most efficient way for foreign experts to ensure that their projects would survive long after their initial contribution.

Besides being recruited by governments and public institutions, foreign technicians were often sent by foreign companies to the Ottoman domains together with new technology (machines, iron bridges), or hired by those companies to build a particular element of infrastructure (port works, railways) in the Ottoman lands. These practices multiplied after the Crimean War, when an unprecedented number of European foreigners from all social classes arrived in Ottoman lands throughout the nineteenth century. British documents concerning foreign affairs recorded that 66 British engineers were working in İstanbul in 1886, while the total number of British subjects residing in the city was 640. That is, more than 10% of British residents were engineers, engineering being the most frequently registered profession among the local British population (Kocabaşoğlu 2004, pp. 170–171). The number of French engineers residing in İstanbul in 1906–1907 was close to 30. This figure includes engineers who were working in İstanbul or its hinterland, as well as those who worked as managers at the headquarters of several French private companies. These numbers, however, are far too low to realistically constitute the total number of French engineers working all around the Empire (Giraud 2002, pp. 25–27).⁴ Engineering and business activities further expanded and diversified from the 1880s on, during the so-called First Era of Globalization (1880–1913), which implied massive penetration of foreign capital into the Empire and direct European intervention into Ottoman affairs, including the establishment of the Ottoman Public Debt Administration in 1881, following the sovereign default of 1875 (Pamuk 1987; Thobie 1977; Geyikdağı 2011). Foreign engineers socialized with their fellow countrymen resident in the Ottoman lands, but also with their colleagues—foreign and local engineers and architects, be they Christian, Muslim or Jewish. After the Young Turk Revolution (1908), freedom of press and association vastly expanded the opportunities for professional activism and foreign engineers did not lag behind their Ottoman colleagues in taking part in the process. Together

⁴ For instance, while there was only one French engineer from the mining company *Société Héracle* residing in İstanbul (he was the general manager) in the above-mentioned statistics, the number of foreign field engineers working in Zonguldak was five.

with their Ottoman (mainly non-Muslim) peers, foreign engineers and architects of various nationalities co-founded and joined the *Association des architectes et ingénieurs en Turquie* (1913–1914), in which, as the press stated, “Ottomans, Germans, French, Austrians, Italians, Swiss, Egyptian(s) and English fraternise under the presidency of Mr. Joseph Aznavour, architect” (GCO 1914, pp. 45–48). In fact, the statutes of this professional society clearly acknowledged the key role foreign experts played in Ottoman engineering and architecture, stating that its council was to be composed of two Armenians, two Greeks, two Jews, two Turks, and two of all other Ottoman ethno-religious groups, and that seven were to be foreigners of different nationalities. Moreover, several journals were published in Constantinople to which foreign engineers actively contributed, including the above-mentioned Association’s journal *Génie Civil Ottoman*, the *Revue Technique d’Orient* and the trilingual German–French–Ottoman *Zeitschrift für Technik und Industrie in der Türkei* (published during the Great War, in 1916–1917).

Vast Ottoman territories were also lands of opportunity concerning the renovation and expansion of communications and infrastructures, and their adaptation to the latest technologies. This stimulated foreign presence in many ways; the engineering projects themselves were appetizing investments for foreign companies, whilst simultaneously contributing to European countries having more economic and political control of the territory. Foreign companies, local entrepreneurs, the Ottoman government and regional authorities all engaged in an unprecedented level of building activity. Ottoman government officials had an undecided attitude towards infrastructural construction projects. On the one hand, they understood them as means to economic prosperity and to a better control of the territory, as well as symbols of what they understood as the *progress of civilization*—an inevitable process resulting from humankind’s striving for perfection, in which, however, no country or group had a guaranteed place and in which an active effort had to be made to participate, and to avoid the danger of falling victim to stagnation or decline. On the other hand, Ottoman statesmen were well aware of potential risks and liabilities, such as providing easy access for foreign armies, or investments being shaped by foreign rather than Ottoman interests. Furthermore, public investment in separatist regions could be lost once these became independent.

Besides the clashing strategic interests of local elites, Ottoman authorities and foreign governments, the rivalry among foreign companies/investors over infrastructure projects was unavoidable, even in cases of relatively minor works. The construction of the quay of İzmir is an example of such rivalry between the British and the French. Although the quay was originally a project of the British settled in İzmir, the company they founded, Smyrna Quay Company, could

not overcome financial difficulties to execute the project. So, the Dussaud brothers, French engineers, bought the company and completed the quay in 1880. It was a success among projects of its kind, for its scale and modernity (Frangakis-Syrett 2001). French companies doing business in Ottoman lands made use of French and foreign engineers who had graduated from French engineering schools. Thus, for instance, Joseph Volay from Lyon, who had received his diploma at the prestigious *École centrale des arts et manufactures* in 1897, worked as a railway engineer in China, the Ottoman Empire (at the Soma-Bandırma railway that employed several *centraliens* of this generation), Spain, Cuba, Syria and France, before becoming (by 1920) the engineer-in-chief of the *Régie général de chemin de fer et travaux publics* in Beirut. Cairo-born Eugène Girard, who had graduated from the same school in 1899, worked as assistant-engineer of the chief engineer at the construction of the Homs-Tripoli (in Ottoman Syria) and the Soma-Bandırma (in Asia Minor) railway lines. Another *centralien*, Félix Courras (grad. 1880), born in the Uruguayan capital of Montevideo, worked in Ottoman Syria for the *Compagnie des chemins de fer de Beyrouth-Damas-Hauran et Biredjik sur l'Euphrate* in 1897 (*Annuaire des anciens* 1920).

While European economic domination grew exponentially, this was also a period of collaboration, joint ventures and multinational teams of workers and experts, cooperating to carry out projects of unprecedented nature, size and complexity. Foreign engineers not only advised Ottoman ministers and other officials of central, provincial and municipal administrations, and taught Ottoman students and trained local apprentices—they also worked in ministerial departments side by side with Ottoman Armenian and Muslim technicians, managed companies owned by Ottoman Jews and Greeks, and founded joint enterprises and applied for concessions with their Ottoman Muslim and non-Muslim colleagues. For instance, another French *centralien*, Émile Foucart (grad. 1879), began his professional career in a family business, *Maison Joly et Foucart*, machine-builders and producers of ceramic products. By 1897, however, he was the manager of a ceramics factory in Karaağaç near Constantinople, an establishment owned by the Camondo family, Ottoman Jewish bankers and entrepreneurs who had moved to Paris in the late 1860s, while they continued to run several businesses in the Ottoman Empire (*Annuaire des anciens* 1897). Foreign and Ottoman engineers worked together on the construction of the Hejaz Railway—the emblematic public works project and propaganda operation of Abdülhamid II's reign, and the first Ottoman railway on which Muslim engineers who had graduated from Ottoman engineering schools worked in significant numbers (Gülsoy 1994).

The multitude of examples of efficient collaboration did not prevent a sense of rivalry. As mentioned above, foreign engineers were often offered much better

contracts and salaries than their local counterparts, who were well aware of this and, particularly after the Young Turk Revolution, felt free to complain. Europeans' knowledge and skills were often taken for granted. It is true, however, that towards the end of the Empire, Ottoman public institutions began to check the engineers' credentials and let them apply only for posts that were considered suitable for their level of qualification, or adapted their salaries accordingly.⁵ Managers of foreign companies tended to seek expert technicians among their fellow-countrymen and among other Europeans, though there was a growing trend to hire Ottoman subjects who had studied abroad—particularly the non-Muslims among them.

There were advantages in employing locals, not only as expert technicians, but also as executive managers: they knew better how to negotiate with the different levels of Ottoman administration, they had useful contacts and they were better at handling local workers than the often arrogant foreign engineers, who expected obedience and were unaware of important and potentially dangerous power dynamics on the construction sites—particularly in rural areas where villagers were employed in the framework of a scheme designed in the mid-nineteenth century, according to which villagers paid their taxes by working in mines, or building and maintaining public works (Martykánová 2010, p. 148; Atayman 1984). Nonetheless, particularly Ottoman Muslim engineers who graduated from Ottoman schools complained bitterly of heavy discrimination, as foreign companies proved extremely reluctant to hire them, even for posts below their qualifications (Uluçay / Kartekin 1958, p. 583).

Public institutions did not always do better in this respect, preferring to import outstanding—and expensive—foreign experts for a specific project, rather than train and employ local technicians, be they Muslim, Armenian, Jewish or Orthodox (Martykánová 2014). On the other hand, the posts of military engineers were staffed exclusively by Muslims, and non-Muslims had very limited options to access the 'technical' posts within the Navy, too. Moreover, during the reign of Sultan Abdülhamid II, policies were put in place striving for an Islamization of public service: putting the newly-founded School of Civil Engineering (1883) under military supervision made it inaccessible to Ottoman non-Muslims. This meant that Ottoman non-Muslims (particularly Armenians) and foreigners that, together with Ottoman Muslims, staffed the administration of Public Works, were to be gradually replaced by Muslim technicians. In practice, howev-

⁵ An example is the 1917 case of the Ottoman authorities' concern over the credentials of Italo Fazanotti. An Italian citizen, Fazanotti applied for the post of engineer in the Istanbul Municipality. As his diploma was of the second class, he was only allowed to apply for the post of assistant-of-the engineer. (BOA, DH.UMVM, file 71, sheet 39, 10 February 1917)

er, the demands of the expanding public works administration made this intention inapplicable, as the government proved to give priority to a swift realization of specific projects, rather than to long-term policies, including the replacement of non-Muslims with Muslims.

The principle of ‘national preference/exclusivity’, defined in terms of Ottoman citizenship and thus including people of all ethno-religious allegiances, shaped the demands of the Ottoman engineers, although they never went so far as to claim that foreigners should be excluded from public employment (a principle that, by the way, was becoming the norm in European countries). When freedom of association was established after the Young Turk Revolution in 1908, the newly created *Osmanlı Mimar ve Mühendis Cemiyeti* (OMMC: Society of Ottoman Architects and Engineers) accepted as members all Ottoman citizens who had a diploma from an engineering school in the Empire or abroad, or who were generally acknowledged as engineers for their work. One of the grievances the Society wished to highlight was the continuing discrimination against Ottoman engineers by companies operating in the Empire, as well as the preference Ottoman public institutions (state or municipal) showed regarding foreign experts. It is no coincidence that this professional association, whose dealings were conducted in Ottoman Turkish, accepted only Ottoman members (most of them Muslims and Armenians), while the francophone *Association des ingénieurs et architectes en Turquie* was open to all professionals who worked in the Ottoman lands, but whose membership was heavily skewed towards foreigners of all nationalities and Ottoman Greeks.

Once the Ottoman Empire became integrated into European power politics and the structures of global capitalism, and opened up to the influx of foreigners of all nationalities and social strata, it became a true land of opportunity for European technicians and entrepreneurs. Despite the growing numbers and self-confidence of local men trained in modern engineering, foreigners never lost their privileged access to engineering works in the sultan’s domains. Even constitutional governments that operated under the notion of national sovereignty preferred their modernizing projects being carried out as quickly and as cheaply as possible to the enforcing of mid- and long-term policies, such as the creation of local schools and training programs driven by the nationalist principle of *kendi ihtiyaçlarımızı kendimiz betaraf etmek*: “to cater for our needs ourselves” (Martykánová 2014, pp.143 – 144).

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