

Industrial architecture in Egypt from Muhammad 'Ali to Sadat: A field survey

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Egypt is one of the first countries in the Middle East to develop modern industries on a large scale. The process started in the early-19th century under the rule of Muhammad 'Ali Pasha (r. 1805–1848), and Egypt remains today a country with an important and diversified industrial sector. It therefore should not come as a surprise that Egypt, like other countries with a long history of industrial development, has a rich and fascinating heritage of industrial architecture. In contrast with other industrial countries, especially in Western Europe or North America, however, this architecture has not been subject to historical documentation and research in any focused or comprehensive manner. Neither has it found much interest among architectural historians or among heritage activists, let alone the public. As of recent years, however, a few master's and doctoral theses coming out of departments of archaeology in Egyptian universities have included industrial architecture of the 19th century. This is largely due to a changing and expanding understanding of al-Athar al-Islamiyya (usually translated as "Islamic archaeology," but meaning the history of Islamic Art and Architecture) to also include the material culture of the 19th century, or at least the Muhammad 'Ali era, within the context of an older and still vibrant nationalist narrative that celebrates him as the founder of modern Egypt. Still, not much thought has been given to the conservation or reuse of industrial buildings of the 19th and 20th centuries

(again with the exception of some remnants from the Muhammad 'Ali period), and they are disappearing in increasing numbers.

While there are numerous publications dealing with Egypt's economic history and industrial development, the only published book on its industrial architecture so far is Mohamed Scharabi's *Industrie und Industriebau in Ägypten. Eine Einführung in die Geschichte der Industrie im Nahen Osten* [Industry and Industrial Architecture in Egypt. An Introduction to the History of Industry in the Middle East] (Tübingen: Wasmuth, 1992). Scharabi is better known for his seminal books *Kairo. Stadt und Architektur im Zeitalter des europäischen Kolonialismus* (Tübingen: Wasmuth, 1989), and *Der*



Fig. 1: Cairo, Citadel Arsenal, c. 1815 and later; aerial view from the southwest c. 1930 showing gun foundry at center bottom.

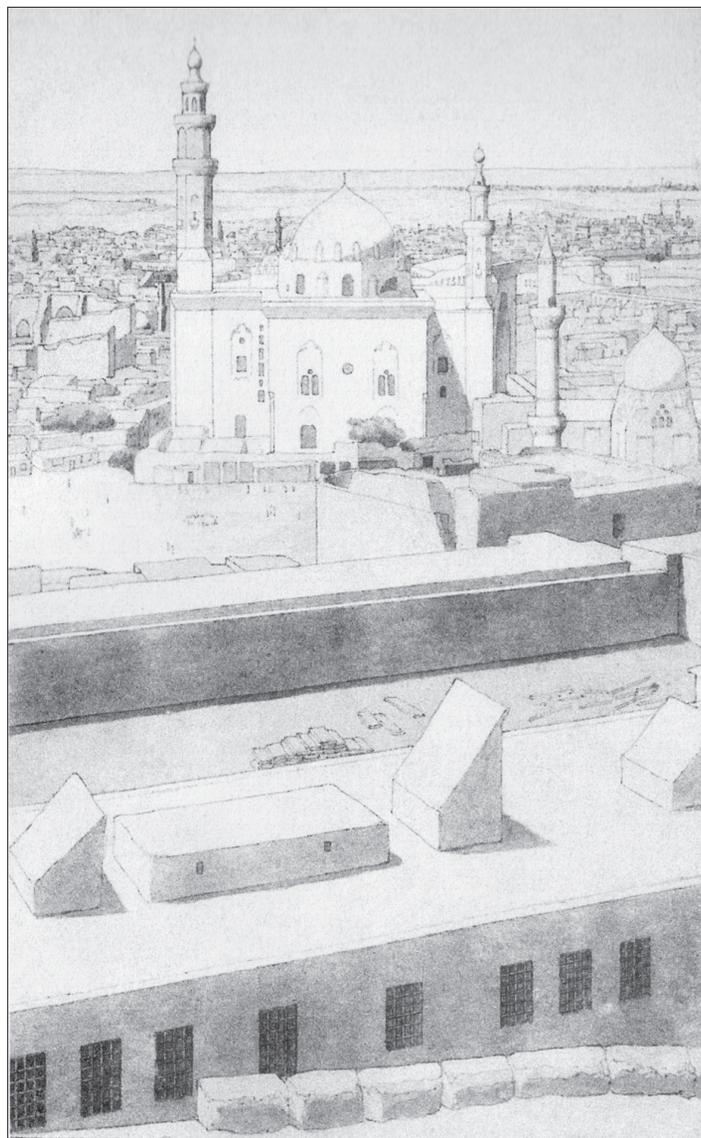


Fig. 2: Citadel Arsenal, drawing from 1825 to 1828 by E.W. Lane showing the roofs with the Sultan Hasan Mosque in the background.

Bazar. Das traditionelle Stadtzentrum im Nahen Osten und seine Handelseinrichtungen (Tübingen: Wasmuth, 1985). With his publications on Cairo and on Egyptian industry, Scharabi is a pioneer in the study of the Middle East's architectural and urban history in the period of modernization. Although his voluminous book on Cairo has become a reference work in the field (despite its disadvantage of being in German) and has found a number of successors, his small booklet on industry is much less known, even though it remains the only monograph available on the subject. Consisting of about 100 pages, including 34 pages of text and more than fifty pages with maps and photos, it is clear that the book

treats the subject on a more modest scale than the title would suggest. The text focuses chiefly on Muhammad 'Ali's industrial projects in Egypt, and combines the descriptions of contemporary observers with a critical evaluation of the process of industrialization until the 1840s, its social and economic implications, the role of Europeans in this process, and the failure of the industrial project from the 1840s onward. For the most part, the book is a history of industrialization, not of industrial architecture as such—the reason being, as Scharabi himself explains, that hardly any industrial buildings from that period have survived. Scharabi adds some brief and general paragraphs on developments from the later part of the 19th century and from the 20th century, including photographs of industrial buildings and maps showing the spatial distribution of industries, with an almost exclusive focus on Cairo. Regarding the later period, however, the visual material is addressed only sparingly. Altogether, Scharabi's interest is less in documenting, describing, and analyzing industrial architecture, than in critiquing the negative effects of foreign experts, models, and imported ideologies (Muhammad 'Ali's mercantilism, British colonialism, the Soviet-supported socialism of the Nasser period, and the United States-aided liberal economic policies of the Sadat era), all of which he judges unsuitable and detrimental within the Egyptian context.

This essay draws on Scharabi's foundational study in various ways, but takes a different approach: instead of starting out from written sources, it begins with field exploration and site visits in an effort to move forward with the much-required work of documenting industrial architecture in Egypt.¹ Based on this approach, I have attempted to give a rough outline of the development of industrial architecture in Egypt during the past two hundred years, starting with the reign of Muhammad 'Ali Pasha and ending in the second half of the 20th century, with the periods of Gamal Abdel Nasser and Anwar el-Sadat. The central questions that this article tries to answer are very basic: What did factories, or industrial buildings more generally, look like in the different periods under

1 The field research for this study was conducted in cooperation with Ahmad el-Bindari, photographer and researcher at the Center for Documentation of Cultural and Natural Heritage (CULTNAT). His profound knowledge of 19th and 20th century architecture in Egypt, and his unfailing help in providing contacts and information, in applying for access permissions, and in visiting and photographing buildings were essential for making this survey possible. I owe him a great debt of gratitude. Special thanks are also due to Adham Nadim of the Industrial Modernization Center for his crucial support. The research begun for this article will be continued and expanded under the auspices of the German Archaeological Institute in Cairo.

study? What were their main architectural characteristics, and how did they develop? I chose to do this by presenting, in more or less chronological order, a selection of buildings and complexes, which at the present stage of research I would consider as representative, or at least illustrative, of the industrial architecture of the different periods. I have attempted to include especially-important factories, identified through literature and word-of-mouth, but inevitably, the selection is strongly determined by the possibilities and limitations under which this study was carried out. Its constraints include the rather short period between April and June of 2009 during which it was conducted, as well as by a certain factor of coincidence relating to what we found and could access during the survey.

Geographically, the examples come from Cairo, the Delta, and Alexandria, thus widening the scope of Scharabi's work considerably by including Egypt's most important industrial cities and regions. The middle and upper Nile valley were not included, as the sites there are more scattered and too distant from Cairo to be addressed within the time constraints of this study. Also, since access to industrial compounds and buildings often requires official permissions, a considerable number of interesting cases could not be visited and photographed. Hopefully they will be accessible in the near future and thus allow for further expansion of this research.

Chronologically, the examples were chosen to cover the period from around 1820 to the 1970s, but due to the regrettable disappearance of many, if not most, structures from the 19th century (the reasons for which I will address), the bulk of the buildings presented date from the end of the 19th century onward. Buildings belonging to the cotton and textile industries are clearly dominant. This is to be expected given the long-standing historical importance of this sector, especially in Lower Egypt. The buildings presented also include those that extend beyond the factory in the narrow sense of the word: waterworks, power stations, railway buildings, and the corollary buildings of factory complexes, such as administration, repair and maintenance, housing, medical care, training, and leisure facilities, all of which form an integral part of Egypt's rich heritage of industrial architecture.

The Muhammad 'Ali period: The pioneering years

Egypt's first wave of industrialization can be dated from the mid 1810s until the late 1830s. It was initially geared to support Muhammad 'Ali's ambitions to build up a modern army, but by the 1820s, it began to serve the more general aim of

reducing dependence on imported manufactured goods.² His general policy was to seize direct control of Egypt's resources in order to secure his rule against the threat of local power groups and the interference of his suzerain, the Sultan in Istanbul. Accordingly, Muhammad 'Ali began to monopolize urban textile production, shutting down smaller workshops and forcing the craftsmen to work in his own factories. He expanded his monopoly over production and trade in rural areas, as well as over the sugar industry and large parts of the building industry.³ He simultaneously engaged in a swift factory-building effort, with substantial help from foreign specialists and advisers whom he engaged from France, Italy, and elsewhere. His first factories included an arsenal for ship building and metal manufacturing opened in 1810 in Bulaq, Cairo's port suburb on the Nile; a textile factory for silk spinning and weaving, established in 1816 in the al-Khurunfush quarter inside the old city of Cairo; and a second arsenal for manufacturing weapons and military equipment, established around 1815 in the citadel of Cairo. Additional textile factories as well as bleaching and print works were soon set up in Cairo and elsewhere, among them a cotton-spinning and weaving mill in Bulaq called "Fabriqat Malta," because of the Maltese origin of many of its specialist workers.⁴ During this period, the term *fabriqa*, along with the Arabic terms *masna'* and *ma'mal*, became common in Egypt to denote modern factories, and continued to be used in the 20th century. Following the successful introduction of long-fiber "Jumel" cotton in 1820, Muhammad 'Ali ordered the construction of fourteen more cotton factories in the Delta between 1821 and 1826, and nine in Upper Egypt in 1827-1828.⁵ Other textile manufactures were set up for wool, silk, linen, and felt—among them the linen factory and the famed tarbush (fez) factory in Fuwwa, built in 1824. Both belong to the very few factory buildings of that period of which remnants still survive today. In the 1830s, there were around forty textile factories in Egypt—at a time, as Scharabi points out, when Prussia had only one.⁶ The two other important types of state factories to be built under Muhammad 'Ali were plants for processing agricultural produce (including at least three sugar

2 Roger Owen, *The Middle East in the World Economy, 1800-1914* (London: I.B. Tauris, 1981), p. 69.

3 Scharabi, *Industrie und Industriebau*, p. 22.

4 The most exhaustive enumeration of factories established under Muhammad 'Ali can be found in 'Abd al-Rahman al-Rafi'i, *Asr Muhammad 'Ali* [The Age of Muhammad 'Ali] (Cairo: al-Hay'a al-Misriyya al-'Amma lil-Kitab, 2000 (1930)), chapters 11 & 13.

5 Owen, *Middle East*, p. 70.

6 Scharabi, *Industrie und Industriebau*, p. 31.

Fig. 3: Citadel Arsenal, view of the southern section showing the 1820s gun foundry with upper-floor additions from the later 19th century.



refineries, nine indigo works, rice mills, and tanneries), as well as arsenals and powder factories.⁷ Beyond those mentioned above in Bulaq and in the Cairo Citadel, two more arsenals were built in Rosetta and in Alexandria. The Alexandria arsenal was set up by the French engineer de Cerisy between 1829 and 1831, and run under the supervision of de Cerisy and the local ship-building master al-Hajj 'Umar. It was large even by international standards as it comprised fifteen workshops and employed 4,000 workers by the late 1830s, when it had already produced 22 naval vessels including nine large warships with over 100 guns.⁸ Powder factories and saltpeter works were built from the late 1810s onwards in several locations in and around Cairo and in Middle and Upper Egypt with the participation of Monsieur Baffi, a chemical engineer from Rome, and his aide, the young French architect Pascal Coste—who was initially hired for this purpose and later moved on to gain fame through other works entrusted to him by Muhammad 'Ali.⁹

From contemporary descriptions and the available literature, we learn much about the equipment, the workforce, and the working conditions in Muhammad 'Ali's factories. Of the 30,000 to 70,000 workers who, according to various estimates, worked there in the heyday of the 1830s, some were women and children (like elsewhere in newly-industrializing countries), and many were forced labor (unlike most other industrializing countries).¹⁰ Work conditions were often bad; sickness, injuries, deaths, and even cases of self-mutilation among workers are reported, as well as fires that frequently destroyed factories partly or completely.¹¹ The predominant use of animal and human power to drive the machinery rather than steam engines (not more than seven or eight in the 1830s) has also been observed. This has led Roger Owen to question how far Muhammad 'Ali's program of factory construction can really be characterized as industrialization, and if—had circumstances allowed—it really could have kept up with England and France on the path of early-19th-century industrialization, as Egyptian nationalist historiography would have it.¹² Although it is true that from the 1820s on, machines were increasingly constructed locally by Egyptian carpenters, smiths, and turners (following the imported mod-



Fig. 4: Citadel Arsenal, gun foundry gate, 1820s.



Fig. 5: Citadel Arsenal, gun foundry, workshop hall with stone arcades.

els and under the supervision of foreign experts), some basic ingredients of successful industrialization were missing and—in spite of numerous efforts—could not be provided locally in a sustained manner. Owen has pointed out the “enormous problems faced by the ruler of a small country with a narrow local market, no coal, wood or workable iron, and none of the accumulated technical or entrepreneurial resources of Western Europe.”¹³ Add to this the difficult task of administering such a complex and dynamic system that in Egypt was solely initiated and run by the government; the resulting widespread mismanagement; the bad and often wasteful use of

7 Owen, *Middle East*, p. 71.

8 *Ibid.*, p. 71; and al-Rafi'i, *'Asr Muhammad 'Ali*, pp. 370-379.

9 Pascal Coste, *Mémoires d'un artiste. Notes et souvenirs de voyages (1817-1877)*, 2 vols. (Marseille: Typographie et Lithographie Cayer et Cie, 1878).

10 The numbers vary considerably according to the sources. See, e.g., Owen, *Middle East*, p. 71; and Scharabi, *Industrie und Industriebau*, p. 28.

11 Scharabi, *Industrie und Industriebau*, p. 22.

12 Owen, *Middle East*, p. 72.

13 *Ibid.*, p. 72.



Fig. 6: Citadel Arsenal, workshop hall next to the gun foundry, view of timber roof with *malqaf*.

human and material resources; and the quick decay of the machinery.

As Owen has argued, the eventual failure of Muhammad 'Ali's industrial scheme, which led to the closure of most factories either in the late years of his rule or during the reign of his successor 'Abbas Pasha (r. 1848-1854), should not be attributed solely to foreign interference, whether the Anglo-Turkish commercial convention of 1838 (which banned all monopolies and preserved a low tariff of 5 per cent on Ottoman imports) or the 1839 Treaty of London (which cut down the size of the Egyptian army and thus removed a central *raison-d'être* for the industrialization scheme). It also has to be seen within the context of inherent structural problems, the international economic crisis of 1836-1837, and a process of policy change, administrative decentralization, and economic retrenchment that took place in Egypt in the late 1830s.¹⁴

14 *Ibid.*, pp. 72-76.

Be this as it may, the abandonment, demolition, or sell-off of Muhammad 'Ali's factories between the 1830s and the 1850s is a major reason why so little of the building stock has survived. Yet, some remnants still bear witness to that period of industrialization.

The one factory complex that can still give a fairly good idea of its original architecture is the arsenal on Cairo's Citadel (figs. 1-11). It is a large complex located along the western side of the Citadel, stretching from the area underneath Burj al-Rafraf and Qasr al-Ablaq, i.e. the present site of the Muhammad 'Ali Mosque, northwards to the Bab al-'Azab area. While the production of arms and military equipment on the Citadel must have begun earlier, at least since 1806, the construction of the arsenal (called *dar al-sina'a* or *tarsana*, in Arabic and Turkish respectively) was definitely in progress by 1817.¹⁵ The gun foundry, a centerpiece of the complex, is dated 1820 by an inscription panel formerly located above the gate.¹⁶ Set up under the supervision of the French mechanic Gonon and the Turkish artillery officer Ibrahim Adham Bey, the establishment comprised "a foundry, machinery for boring cannon, reverberating furnaces, and various other useful works," and employed 600 workers.¹⁷ In 1824, a large fire and the explosion of a powder magazine in the Citadel reportedly destroyed considerable parts of the complex, in addition to claiming about 4,000 lives and destroying around fifty adjacent houses. In the following years, the arsenal was repaired and enlarged. Next to the foundry, large workshops were built for producing rifles, swords and lances, copper plates (used for building warships), powder boxes, and other military equipment, employing about 900 workers at the height of production during the 1830s.¹⁸

Due to the reduction and partial suspension of weapon production in the 1840s, as well as the later reuse of the arsenal buildings (by the British army between 1882 and 1946, and subsequently by the Egyptian army until 1984), many of its extant buildings were subject to alterations, and additions. At present, the original shape and function of many of

15 From that year onward, the arsenal on the Citadel is repeatedly mentioned by Coste, *Mémoires*, vol. 1, pp. 13, 15, 25 et 28.

16 See Khalid 'Azab, *Dar al-Saltana fi Misr: al-'Imara wa'l-Tahawwulat al-Siyasiyya* [Dar al-Saltana in Egypt: Architecture and Political Transformations] (Cairo: al-Majlis al-A'la lil-Thaqafa, 2007), p. 155.

17 James Bell, *A System of Geography, popular and scientific, or a physical, political, and statistical account of the world and its various divisions*, vol. III (Glasgow: Archibald Fullarton and Co., 1832), p. 338, fn. 15; see also Felix Mengin, *Histoire de l'Égypte sous le gouvernement de Mohammed-Aly*, 2 vols. (Paris: Arthus Bertrand, 1823), vol. 2, p. 379; and al-Rafi'i, '*Asr Muhammad 'Ali*', pp. 341-342.

18 al-Rafi'i, '*Asr Muhammad 'Ali*', pp. 341-342.

its parts remain unclear.¹⁹ The general layout, however, can still be discerned: a sequence of broad straight thoroughfares is lined on both sides by single-story buildings with high limestone walls and arched gates. Some buildings have segmentally or round-arched windows on the ground-floor level; others only have small rectangular windows in the upper parts of the wall. In the arsenal's southern sections, these buildings are primarily large halls, covered with flat roofs in wooden girder-and-beam construction carried on wood posts, stone pillars, or stone arcades (figs. 5-7). When necessary, the long spans of the girders are supported by systems of wood props. The roof skin is made of wood paneling covered with a smooth layer of mud. Light and ventilation are provided through the roof by regularly-distributed wind catchers—the typical Egyptian *malqaf*, or sloped wooden constructions with openings facing north. The original appearance of these buildings is blurred by later alterations. Some roofs are recognizably renewed: skylights with glazed windows replaced some of the earlier *malqafs* later in the 19th century; windows, doors, and gates have been altered or added; whole stretches of walls seem to have been rebuilt; and a metal roof in steel-truss construction has been built over the southern end of the central thoroughfare during the British occupation of the site.²⁰ But the architectural remains, together with a drawing by Edward William Lane from the late 1820s (fig. 2) and various 19th-century photographs of the Citadel, the Sultan Hasan mosque, and the Rumayla area (in all of which the arsenal buildings appear) give a fairly good idea of the early appearance of these large factory halls with their flat roofs interrupted by numerous *malqafs*.

Besides the halls, a second building type is found within the arsenal complex: courtyard buildings with rectangular courtyards enclosed by plain stone arcades that carry flat wooden roofs, again supported by wooden props, a technique they have in common with the halls (fig. 9). Lined up along the rear side of the galleries are rooms, opening onto galleries through arched gates topped by small square windows.²¹ As an architectural solution for spaces of production, this courtyard type can be seen as a continuation and adaptation of the older local forms of the commercial *khan* and *wikala*

19 See, 'Azab, *Dar al-Saltana*, p. 155.

20 Detailed documentation and an architectural-archaeological study are certainly desirable to gain a better understanding of the development of this complex.

21 Again, other types of openings found here, like rectangular doors and large rectangular windows, indicate alterations dating from the late-19th and early-20th centuries.



Fig. 7: Citadel Arsenal, workshop hall facing the gun foundry, view of timber roof on stone pillars.

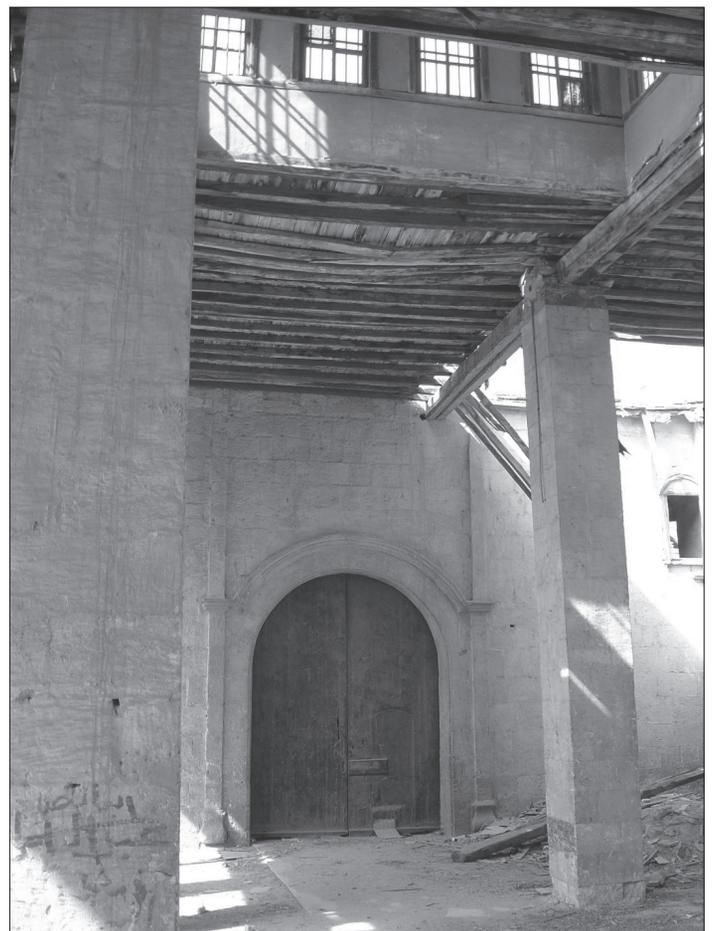


Fig. 8: Citadel Arsenal, central section, view of a workshop hall with an interior gate built in the Rumi style.



Fig. 9: Citadel Arsenal, northern section, view of a workshop of the courtyard type.

building types, reduced to a simple single-story structure. The halls, by contrast, are early witnesses to an effort to create large covered spaces with a minimum of posts or pillars. Here too we can observe a partial adoption of techniques that had already been in use for another building type that incorporated large halls: mosques.

Although this was a factory for casting and working iron and other metals, its construction did not incorporate any structural iron elements. As we shall see, iron columns and beams did not come into use in Egypt before the late-19th century. This is interesting because Muhammad 'Ali had modern machinery imported from England and France, and he imported marble from Italy and wood from the Balkans and Anatolia for other building projects such as his palaces. Using imported materials was therefore an easily-available option. Also, employing technicians, builders, and artisans from outside Egypt was becoming increasingly common, at least for building projects commissioned under the patronage of Muhammad 'Ali and his entourage. In particular, the important role of "Rumi" master builders and craftsmen (often misleadingly referred to as "Greeks" in European sources) is well known.²² The Pasha's factories were erected at a time when the building trade in Egypt had already become a fair-

22 See, e.g., Gaston Wiet, *Mohammed Ali et les beaux-arts* (Cairo: Dar al-Ma'arif, 1950), passim. While in 19th century Arabic sources by authors like al-Jabarti and 'Ali Mubarak, the meaning of the term Rumi is clearly used as referring to Bilad al-Rum, i.e. the Ottoman core provinces, it has often been misinterpreted, especially in architecture-historical literature, as meaning either Greek (from Greece) or Roman (from Italy), or even European.

ly "international" business involving builders from various origins and backgrounds, and factory architecture must be seen in this context. This is illustrated by an account that Pascal Coste provided. As mentioned above, Muhammad 'Ali initially hired him in 1817 to plan and build a saltpeter factory in Badrashin under the directorship of the Italian chemist M. Baffi. Here, Coste employed local masons and Cairene plasterers. He went on to plan and build a powder factory on the island of Rawda at Fustat in Cairo, where the masonry was executed by "Arab workers" supervised by an "Arab," and the mechanical work, woodwork, and carpentry work was done by "Greeks, Italians, and Maltese" under the supervision of a "Greek."²³

However, for the arsenal—as for most other factories—we have no sources (yet) to inform us who actually designed and constructed the buildings. It is questionable whether the above-mentioned Frenchman Gonon, identified as a mechanic from Lyon by Coste, or the Turkish artillery officer Edhem Bey, played any prominent role in this—except maybe in the general spatial organization in so far as it related to the production process. But we can draw some conclusions from the architecture of the arsenal buildings themselves. For example, the overall structural set-up of walls and roofs, as described above, shows that the materials used were essentially limited to what was locally available or—in the case of wood beams and panels—available through regular import. The basic layout of halls and courtyard structures and their building techniques drew on established traditions mastered by local masons and local or Rumi carpenters.²⁴ That there indeed was close cooperation between local and Rumi builders is clearly discernible in the architectural style and decoration of the arsenal buildings, which have a number of features in common with the few other identified remains of industrial buildings of the period.

Their overall external appearance is plain and austere, with long stretches of walls articulated only by slim cornices, by regularly-spaced windows in the upper parts, and some-

23 Coste, *Mémoires*, vol. 1, pp. 17 et 25.

24 There is one notable exception, which is the chimney of the gun foundry. During my research, I found that it is built of special refractory bricks bearing stamps of the brickworks of A. Bald in Alloa, Scotland, which allows the dating of their production to the 1820s or shortly thereafter. As the chimney has a shape very similar to chimneys in that same Scottish region, it is possible that Scottish or other foreign masons were involved in its construction. Further research on this subject is still underway. In this context, I would like to thank Veronica Fraser of the Royal Commission on the Ancient and Historical Monuments of Scotland for her generous help in providing information on Bald's brickworks in Alloa.



Fig. 10: Citadel Arsenal, southern section, neo-Classical gate added in the 1860s or 1870s.



Fig. 11: Citadel Arsenal, northern section, a hybrid neo-Classical gate with Castle-Style crenellations, probably dating from the 1850s or 1860s.



Fig. 12: Fuwwa, Linen Factory, 1824; main gate.



Fig. 13: Fuwwa, Tarbush Factory, 1824; main gate.



Fig. 14: Tarbush Factory, interior gate.



Fig. 15: Alexandria, gate of an unidentified factory from the Muhammad 'Ali period, c. 1820s or 1830s.

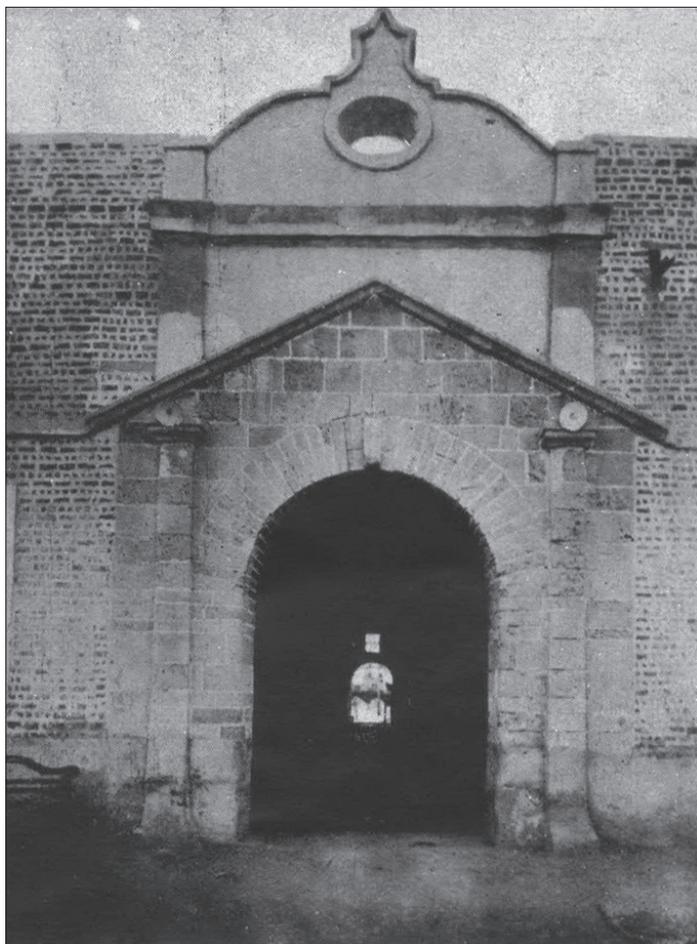


Fig. 16: Rosetta, gate of a textile factory from the Muhammad 'Ali period, c. 1820s or 1830s.

times by larger arched windows on the ground-floor level. More elaborate stone decoration is used for the gates (figs. 4, 8 & 12–16). Here, we find round or segmental arches with molded archivolts framed by slim pilasters and curved cornices, which are characteristic of the so-called Rumi style—i.e. the local variation of Ottoman baroque produced by Rumi builders and favored by Muhammad 'Ali and his family for their palaces. Yet, within the Rumi-style framework of the gates, we also find arches with lobed and zigzag moldings, and bands with arabesque carvings characteristic of the so-called 'Abd al-Rahman Katkhuda style—a richly decorative style fashionable in Cairo around the mid-18th century.²⁵ The use of such decoration for monumental factory gates built as late as the mid 1820s (e.g., the tarbush factory in Fuwwa from 1824, and a factory of yet unclear function on the

25 See, Doris Behrens-Abouseif, "The 'Abd al-Rahman Katkhuda Style in 18th c. Cairo," *Annales Islamologiques*, 26 (1992), pp. 117–126.

Mahmudiyya Canal in Alexandria) provides evidence of the influential role of local stone masons in the architecture of Muhammad 'Ali's factories. It also indicates a longer survival of local artistic traditions under Muhammad 'Ali—even in building projects under his patronage—than has hitherto been acknowledged. The Pasha evidently did not always see expressions of local Egyptian culture as an obstacle to his modernization program, as has been argued.²⁶ At least in the case of his factories, which were important material expressions of this modernization program, he sometimes integrated them prominently.

Judging from the surviving remains, it is clear that Muhammad 'Ali's factories were not conceived as mere utilitarian buildings, but also as architectural monuments built to impress and to visually communicate the Pasha's ambitions. This architectural quality was acknowledged even by otherwise rather critical observers of the time. For example, the Englishman James St. John, who traveled throughout Egypt in the early 1830s and had already witnessed and commented upon the failure of many of the Pasha's industrial endeavors, mentions a second gun foundry in Cairo (besides the one in the Citadel) that he qualified as being "at appearance, the finest in the world."²⁷ He also expressed his admiration for the size, the identical plans, the architecture, and the siting of cotton mills he saw on his way to Upper Egypt:

They are constructed with rubble and mortar, and covered externally with stucco. For the small number of machines they contain, they are much more spacious than necessary. The apartments, which are flagged with stone, are extremely lofty, and the doors and windows proportionably large. All the bull-ock-mills, along the front of the buildings, are enclosed in large towers, adorned with bow windows, balconies, and balustrades. Spacious flights of stone steps ascend to the second story, and the entrance is generally shaded by a light wooden trellis-work. All these buildings are erected in the finest situations.²⁸

26 For the argument that Muhammad 'Ali discarded the indigenous style, see Doris Behrens-Abouseif, "The Visual Transformation of Egypt During the Reign of Muhammad 'Ali," in Doris Behrens-Abouseif and Stephen Vernoit (eds.), *Islamic Art in the 19th Century: Tradition, Innovation, and Eclecticism* (Leiden: Brill, 2005), pp. 115 & 117–118.

27 James Augustus St. John, *Egypt and Mohammed Ali*, 2 vols. (London: Longman, 1834), vol. 2, p. 424; and Scharabi, *Industrie und Industriebau*, p. 26.

28 St. John, *Egypt and Mohammed-Ali*, vol. 2, p. 417. The term "apartments" was misinterpreted by Scharabi as referring to residential spaces—which would have been the earliest evidence for such functions being included in factory spaces (see, Scharabi, *Industrie und Industriebau*, p. 25). However, it is clear from the context that the term is used in the sense of compartments within the production space. This does not preclude the possibility that there were rooms with administrative or residential functions.

This account provides important evidence of the existence of buildings with towers and a second story, and of the use of architectural decoration in prominent parts of those buildings other than gates, thus underlining their intended visual and monumental function. Also, the intricate connection between the productive and the monumental nature of the structure can be observed from the siting of at least some factories, which provides for a striking effect that can still be experienced today in Fuwwa or Alexandria. They were built along the Nile or a canal for the obvious reason of providing direct access to river transport; but at the same time, they prominently presented their main façades, along with their monumental gates, to the waterfront.

However, as evinced by many other cases that have not survived, but that are documented in historical accounts and maps, factories were often located away from the river, on the outskirts of cities, or even within dense urban fabrics.²⁹ Research into a possible relationship between the location and function of factories from the Muhammad 'Ali period is still a desideratum.

The 1850s to the 1880s:

Downsizing and restructuring

The period following the rule of Muhammad 'Ali until the revolution of 1919 is sometimes depicted—especially in Egyptian nationalist historiography—as one of de-industrialization and stagnation. The reality, however, is more complex. The gradual abandonment and closing down of factories that began during Muhammad 'Ali's reign and continued during the rule of his successor 'Abbas Pasha was far-reaching, yet incomplete. Alfred von Kremer, writing in the early 1860s, during the rule of Sa'id Pasha (r. 1854–1863), listed a number of active industries: silk and cotton weaving, indigo dyeing, copper manufacturing, leather tanning and shoe production in Cairo, and wool weaving in Fayyum. He confirms, however, that the state-run factories had been all but closed down, including some that had actually been founded only recently by Sa'id Pasha, pointing to an attempted revival.³⁰

29 Regarding the location of factories, see the maps in Mercedes Volait, *Architectes et architectures de l'Égypte moderne, 1830-1950: Genèse et essor d'une expertise locale* [Architects and Architectures of Modern Egypt, 1830-1950: Formation and Rise of a Local Expertise] (Paris: Maisonneuve et Larose, 2005), pp. 128-142; and Scharabi, *Industrie und Industriebau*, pp. 23-24.

30 Scharabi, *Industrie und Industriebau*, p. 35; Alfred von Kremer, *Aegypten. Forschungen über Land und Volk während eines zehnjährigen Aufenthalts* [Egypt. Studies on the Country and the People during a Ten-Year Stay], 2 vols. (Leipzig: Brockhaus, 1863), vol. 2, pp. 215-216.



Fig. 17: Alexandria, Minat al-Basal District, port and warehouse-related building, c. mid-19th century.



Fig. 18: Alexandria, Minat al-Basal District, gatehouse of a warehouse complex, c. 1860s or 1870s.

Sa'id Pasha's policy included asset-stripping and demolition of existing factories, or alternatively their sale or lease to private persons and enterprises. But he also reactivated factories that had been closed by his predecessor 'Abbas Pasha, among them the tarbush factory in Fuwwa and sugar factories in Bani Suwayf, and he introduced factories for pressing cotton-seed oil, used for soap and candle production. Because of the Egyptian involvement in the Crimean War (1853-1856), the arms industry was revived and arsenals were reactivated, with gun, rifle, and saber production in Cairo, and shipbuilding in Alexandria. Industrial ambitions were very much alive during this period, as highlighted by the fact



Fig. 19: Fuwwa, ginning mill next to the Tarbush Factory, probably 1850s–1860s; two-story building at the eastern end of the complex.



Fig. 20: Ginning mill next to the Tarbush Factory, eastern main facade of the truss-roofed workshop building.

that the stamp "*Suni'a fi Misr*" ("Made in Egypt") was introduced for the first time in 1856 to mark all military equipment.³¹ At the same time, railway construction began in Egypt, with the appendant station and workshop buildings. The Alexandria – Cairo line was built between 1854 and 1856, and the network was steadily expanded to cover most of the Delta, extending as far south as Asyut by the 1870s.³²

31 See, Zayn al-'Abidin Shams al-Din Nagm, *Misr fi 'Ahd al-'Abbas wa Sa'id* [Egypt During the Reigns of 'Abbas and Sa'id] (Cairo: Dar al-Shuruq, 2007), pp. 155–157. This publication contains a concise overview of the industrial activities of the period.

32 For a detailed timeline of railway construction in Egypt, see al-Rafi'i, 'Asr

The introduction of railway transportation to the country opened up new locations for industrial activities. In Alexandria, a freight railway was built in the 1850s to serve the western port. Together with the adjacent Mahmudiyya Canal already built under Muhammad 'Ali, it triggered extensive industrial development in this area.³³

Another step of far-reaching importance during Sa'id's rule was the abolition of Muhammad 'Ali's government monopoly system and the opening-up of production and trade to foreign investors. This led to an influx of foreign businessmen and "adventurers," who established themselves in Alexandria and along the Nile up to Cairo, founding companies mainly for the exploitation of Egypt's agricultural products for industries in Europe—chiefly, of course, cotton.³⁴ Numerous mechanized cotton ginning mills were set up beginning in the mid 1850s, reaching eighty by 1863. In fact, cotton ginning has been identified as the most important industrial activity under Sa'id Pasha.³⁵ The development of Egypt's agro-industries continued under the rule of Khedive Isma'il (r. 1863–1879), now with a renewed and intensified involvement of the ruler himself as a quasi-"private" investor through *al-Da'ira al-Saniyya*, the administration of vice-regal properties. Cotton production and processing remained an important focus of European and Khedival investment. This was driven by the cotton boom resulting from the disruption of cotton supplies from the United States following the outbreak of the American Civil War, and growing further after a short-lived decline that followed the end of the war.³⁶ The other quickly-growing industry was sugar production, which remained limited to cane pressing and molasses production until the 1880s, with *al-Da'ira al-Saniyya* being the largest producer. The construction by *al-Da'ira al-Saniyya* of light railways serving agricultural areas further buttressed these developments.

Other industries that thrived under Isma'il were—again—arms factories and plants for military supplies, including two broadcloth weaving mills in Bulaq and Shubra, and factories catering to the needs of a growing administration, such as, the paper factory in Bulaq. The Khedive also established a brick factory in Qalyub, as well as a glass factory and a leather tannery in Alexandria. Moreover, there were smaller pri-

Muhammad 'Ali, pp. 16–18.

33 Marc Crinson, *Empire Building. Orientalism and Victorian Architecture* (London: Routledge, 1996), p. 171.

34 Nagm, *Misr*, pp. 152–153.

35 Owen, *Middle East*, p. 138; Nagm, *Misr*, p. 153.

36 Owen, *Middle East*, p. 135.

vately-owned factories that produced food, household items and other equipment, in addition to steam-driven flour mills.³⁷

From this certainly incomplete list, it is clear that there was considerable construction activity for industrial buildings between the 1850s and the 1880s. Also, in contrast to the earlier part of the 19th century, industrial buildings of the modern factory sector were not only built by the ruler or the state, but by private entrepreneurs and investors as well. It is certainly true—as Scharabi observed—that most of the private enterprises were family-sized ones. This also meant that the bulk of factories and workshops were probably small and not necessarily durable, agglomerating in urban industrial neighborhoods—as with Bulaq and Sabtiyya in Cairo—in a spatially only loosely-definable way that may still be observed today.³⁸ But as the examples of mechanized ginning mills or steam-powered flour mills show, there also were privately-owned factory buildings of a more substantial size. At any rate, this period witnessed an important shift in the patronage of industrial architecture in Egypt, and the role of private enterprise in producing this architecture was to increase further, until the advent of nationalization under Gamal Abdel Nasser in 1956. Moreover, until the 1920s, these investors were mostly foreigners, or non-Egyptian “local foreigners,” whose transnational backgrounds and networks contributed to the formation of a more international or “globalized” architectural language of industrial buildings in Egypt.

In general, the second half of the 19th century was a transformative period for Egyptian architecture, whether in terms of architectural styles or construction techniques. Stylistically, an increasing taste for historicist and eclectic styles of European inspiration may be observed, promoted by European architects hired by the ruler's family, local foreigners, and members of the local Egyptian and Turkish elites. In terms of construction techniques, iron, and later steel construction began to appear, yet at first only sporadically. In palace architecture, this is evident in the Gezira Palace with its famous cast-iron colonnades in Moorish style designed by Karl von Diebitsch in 1863–1864. In bridge construction, examples include the railway bridges across the Nile at Banha and Kafr al-Zayyat built by Robert Stephenson in 1854; the Qasr al-Nil bridge in Cairo built by Linant de Bellefonds and

the French company Five-Lilles between 1869 and 1871; and its counterpart, the Pont des Anglais, built immediately afterwards by the British engineering firm Shaw and Thomson. There also are extravaganzas such as the miniature suspended bridge built by the prolific Gustave Eiffel between 1873 and 1875 across a pond in the Giza palace gardens (now the Giza Zoological Gardens).³⁹ By and large, the material and know-how for these metal structures were imported from abroad, and it is important to note that while prefabricated elements like iron railings, balcony balustrades, and window grills became widely fashionable in domestic architecture, the use of iron and steel for structural purposes (especially floor, ceiling, and roof construction) remained exceptional until the last decade of the 19th century, even though it was technically possible beginning in the mid-19th century.⁴⁰ This wide range between what was feasible and what was commonly applied in construction is an important characteristic of this period in Egypt, and accounts for the increasing variety and contrast in its architecture. It also poses the question of how far industrial architecture in Egypt made use of new construction techniques.

As for industrial buildings from the 1850s to the 1880s, very few seem to have survived. It is possible, however, that among the many old ginning mills in the Delta and the equally-numerous old cane-pressing works in Upper Egypt that have not been visited yet, some still preserve remnants of their founding years. But we should not hope for much. The oldest sugar refinery of this period, built in al-Hawamdiyya, to the south of Cairo in 1881 (fig. 21), is today a vast complex of 20th century structures with no visible traces of its original 19th century buildings. Where factories continued to operate, technical upgrading and modernization have taken their toll

37 *Ibid.*, p. 151; ‘Abd al-Rahman al-Rafi‘i, ‘*Asr Isma‘il* [The Age of Isma‘il], 2 vols. (Cairo: al-Hay‘a al-Misriyya al-‘Amma lil-Kitab, 2000 (1932)), vol. 1, p. 253, and vol. 2, pp. 13–15; and Scharabi, *Industrie und Industriebau*, pp. 36–37.

38 Scharabi, *Industrie und Industriebau*, p. 36.

39 For a good overview of these developments, see, Ghislaine Alleaume and Mercedes Volait, “The Age of Transition: The Nineteenth and Twentieth Centuries,” in André Raymond (ed.), *The Glory of Cairo: An Illustrated History* (Cairo: AUC Press, 2002), pp. 361–464, esp. 370–393; for the bridges, see also, Samir Raafat, “A Bridge Misunderstood,” *Egyptian Mail*, Saturday, April 29, 1995.

40 In his treatise on construction in Egypt from 1875, Edouard Mariette mentions timber-iron and iron floor construction, but states that timber construction was the most widespread. He also indicates that imported prefabricated iron elements were available in the market, but that special iron elements were hardly used except in industrial buildings. In addition, he cites two ironworks (at the railroad workshops in Bulaq and at the Engineering and Cotton Machinery Company in Alexandria) that could produce such special elements on demand. See, Edouard Mariette, *Traité pratique et raisonné de la construction en Égypte* [Practical and Critical Treatise on Construction in Egypt] (Alexandria: Imprimerie française A. Mourès, 1875), pp. 110 & 363. From my own research on 19th-century architecture, it is clear that floors incorporating jack arch construction (i.e., flat brick vaults built between small steel girders) became more common only in the 1890s.



Fig. 21: al-Hawamdiyya, Sugar Refinery, originally founded in 1881; view of the northeastern section showing buildings dating from the early to the later 20th century.

on the building stock, and where factories were abandoned, they usually either collapsed or fell victim to redevelopment. But there are a few structures that can help us obtain a preliminary idea about this period's industrial architecture.

One is a peculiar building located in the Minat al-Basal district of Alexandria, right next to the so-called Old Bridge across the Mahmudiyya Canal, close to where the canal connects to the western port (fig. 17). This was an area where industrial and port-related activities had already begun to develop during the time of Muhammad 'Ali. The building is a rectangular, flat-roofed two-story block with a ground floor built of limestone ashlar. The upper floor is of plastered brick construction with horizontal timber beams integrated into the masonry. All ceilings are of timber construction. We are therefore dealing with long-established materials and techniques. The peculiarity of the building derives from its arcaded façades. The eastern and main façade, which runs along the street and the canal, as well as the narrow southern façade are both composed of a double-story arcade of round arches with profiled archivolt and imposts on square pillars. The façades are further decorated with neo-Renaissance elements such as rustication work on the corners, a string course on the first-floor level, and a cornice with concave moldings, all worked in white limestone. Joints in the masonry indicate that the arches were originally open, but were later walled up, and some were equipped with gates or windows (based on constructional features, this appears to have taken place in the later 19th century). Behind the arcades on both floors are rooms with doors leading into the rear parts of the

building, which currently are not accessible.

The date and the function of the building remain unclear at this point. Construction techniques and decoration allow a dating to some time between the first half and the third quarter of the 19th century. Important additional clues are provided by a map of Alexandria drawn by Charles Muller in 1855. It shows extensive building activity in this area—including a shape that could be the building—and summarily identifies structures as "magasins," i.e., warehouses.⁴¹ It is very possible that this building is the last remnant of these warehouses, and this could explain its unique arcaded architecture as a kind of *khan* turned "inside out." Stylistically, the original arcades with their combination of limestone and brick show intriguing similarities to 18th-century İstanbül *khans* like the Büyük Taş Han – a feature that may indicate the participation of Rumi builders, and would either support a dating to the first half of the 19th century, or give evidence of a survival and innovative adaptation of *khan* architecture into the mid-19th century. Further research into this structure would be very desirable, as it is presently abandoned, is for sale, and might disappear very soon.

An adjacent gate house, located at the southwestern corner of the *khan* building, might also have belonged to the same former warehouse complex (fig. 18).⁴² The stylistic features of this two-story building suggest a dating to the 1860s or 1870s. The rusticated ashlar masonry, the round-arched gate and windows, the pilasters, architrave, and cornice, and the plastered upper story with rectangular windows and a curved pediment framing a stucco rosette combine Ottoman Baroque, neo-Renaissance, and Classicist elements, and fit into the general stylistic trends familiar to palace architecture in Egypt of the 1860s and 1870s. Surviving factory gates of a similar style can be found in the Citadel arsenal of Cairo (figs. 10 & 11), combining Classicist pilasters and architraves with Baroque cartouches and Castle-Style crenellations, and are clearly identifiable as renovations and additions dating to the rule of Sa'id and Isma'il.⁴³ Here again, as in Muhammad 'Ali's time, we see a continued pattern of giving industrial buildings a monumental allure. Whether this warehouse gate

41 See the reproduction of the map in Robert Ilbert, *Alexandrie 1830-1930*, 2 vols. (Cairo: IFAO, 1996), vol. 2, p. 776.

42 At present, the building is not accessible. It belongs to the neighboring complex of the Société Générale de Passage et de Dépôts, built in 1956, replacing older structures.

43 Additions and renovations in the Citadel arsenal dating to the period of Khedive Isma'il have also been identified during research conducted by Professor Hussam Isma'il, architectural historian at 'Ayn Shams University. I would like to thank him for sharing his results with me.

in Alexandria was built by a private-sector patron or not cannot be determined yet.

A third structure that most probably dates from the 1850s to the 1880s is a factory building in Fuwwa (figs. 19 & 20), located along the western bank of the Nile, on a plot right next to the tarbush factory (figs. 13 & 14). It is a small, abandoned complex consisting of a courtyard enclosed by a lofty workshop building on the west, and a small two-story building on the east, as well as some smaller auxiliary buildings. The exclusive use of burnt-brick masonry with beams, lintels, and ceilings of timber without any iron elements would—at the present state of research—suggest a date of construction definitely before the 1890s, and possibly as early as the 1850s or 1860s.⁴⁴ The complex, registered as a monument in the late 1990s, has actually been identified as a ginning mill. It is said to date to the Muhammad 'Ali period—which, however, would seem too early for a ginning mill.⁴⁵

From a typological point of view, the factory hall in the west is the most interesting. Among the buildings surveyed, this is the earliest example of a long rectangular hall with gable walls, a double-pitched roof in truss construction, and a monitor (clerestory). The external walls have a height equivalent to two stories and are built in plastered brick masonry. The façades feature relatively large round-arch windows, and an oculus window with geometric wooden tracery decorates the gable wall. The truss roof is of timber construction and spans the width of the building. The roof is presently covered with corrugated metal sheets, but the original roof cover must have been different (probably wooden paneling). Thus, the building combines long-established "low-tech" building materials and techniques with the newly-imported system of the truss roof to produce a large single-floor hall with a single aisle and large clearance, uninterrupted by pillars or posts. As a building type, the truss-roofed hall was al-

ready well-known earlier on in the 19th century in Europe and the United States, and by the end of the 19th century it had demonstrably become a common form of factory halls—and particularly of ginning mills—in Egypt. If, as it appears, the truss-roofed hall in Fuwwa dates from the 1850s or 1860s, then this would provide precious evidence for its use in Egypt at this relatively early date.

As a preliminary conclusion, I would therefore claim that between the 1850s and the 1880s, industrial architecture in Egypt began to gradually adapt European building forms, construction techniques, and architectural styles. Local conditions, dependency on local construction workers, and the limited availability or high costs associated with modern building materials like iron and steel made this an uneven process, and resulted in the continued application of older established building techniques, in selective combination with new ones. Thus, new construction techniques were applied in wood, whereas the use of metal elements appears to have remained exceptional. To date, no industrial buildings before the 1890s could be identified that used any of the modern metal construction techniques that were—at least theoretically—available. Considering the limited evidence, however, and with further buildings still to be explored, this initial conclusion might need to be revised.

The 1890s until the First World War: Monumentality at work

In contrast to the previous periods, the two decades before the First World War have left behind an important number of industrial buildings. The architecture of these buildings also became much more closely connected to global developments of industrial architecture, the background of which can only be outlined very roughly here. Generally, as Roger Owen has shown, Egyptian industry developed only slowly during this period. The British-controlled administration, established with the British occupation of 1882, is known to have focused on developing the agricultural sector. Industrial investment was limited to the agro-industries that processed cotton and sugar to be exported as raw materials for industries in Britain and elsewhere. Developing local industrial production was of secondary importance, at best. Whether the British administration under Lord Cromer deliberately obstructed industrial development in Egypt to protect British interests is a controversial issue marked by inconsistencies in the administration's own politics.⁴⁶ What is defi-

44 The interior of the factory hall is not accessible, as all doors and windows have been walled up. It cannot yet be ascertained whether this hall incorporates metal construction elements. All the accessible parts of the complex, however, do not show any use of metal elements, and in the one annex where steel girders are found, they are clearly later additions.

45 Khalid 'Azab, "Athar madinatay Fuwwa wa-Rashid fi 'asr Muhammad 'Ali," in Ra'uf 'Abbas (ed.), *Islah am tahdith? Misr fi 'asr Muhammad 'Ali* [Reform or Modernization? Egypt in the Age of Muhammad 'Ali] (Cairo: al-Majlis al-A'la lil-Thaqafa 2000), pp. 573–596, here p. 577. Dating such a ginning mill to the Muhammad 'Ali period does not seem accurate, because mechanized ginning (which required this type of long halls to set up the roller gins in rows) was not introduced until the mid-1850s. More research into this building and its original interior layout is needed before any definitive conclusions may be made.

46 For a discussion of this issue, see, Roger Owen, "Lord Cromer and the Devel-

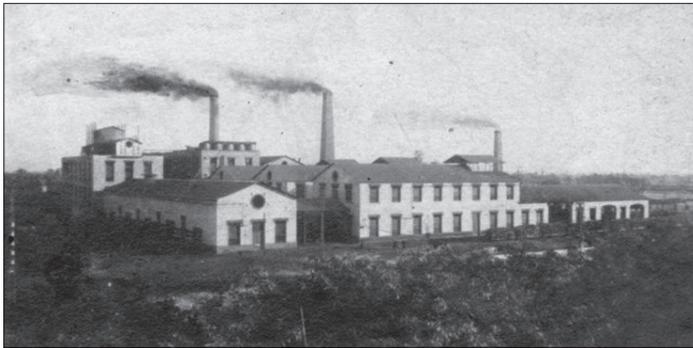


Fig. 22: Nag' Hammadi, Sugar Factory, 1897; photo from a c. 1899 postcard.

nite is that the British regime increased cotton and sugar-export production, as well as capital accumulation and the commercialization of land.

However, there was a considerable increase in investment in business and industries by foreigners as well as locals, at least until the Egyptian financial crisis of 1907. This led to establishing new firms and to a process of capital concentration in the hands of what Robert Vitalis has called "landlord-capitalists." These included locals and local foreigners with large agricultural holdings who, often in partnership with foreign capital and business partners, began to invest not only in cotton and sugar processing, but also in import-substitution manufacturing, transport infrastructure, urban services, land development, and banking.⁴⁷ The families that took center stage in this period were to play an important role in Egypt's industrial development until the nationalization of the late 1950s. Egyptian Jewish families like Suarès, Cattaoui, Menasce, and Rolo, and Alexandrian Greek families like Salvago, Choremi, and Benaki formed investor coalitions such as the Suarès group and the Salvago group that were involved in almost every major capitalist enterprise in Egypt during that period.⁴⁸

A prominent example of capital concentration at that time is the creation of the giant Société Générale des Sucrieries et de la Raffinerie d'Égypte in 1897. Sugar refining was developed through a small number of newly-founded private companies, with the first refinery plant built by the Suarès group in al-Hawamdiyya south of Cairo in 1881. The merger of this enterprise with another Suarès-controlled French-

Egyptian sugar company led to the creation of the Société Générale des Sucrieries et de la Raffinerie d'Égypte, at the time Egypt's largest industrial concern. They built a new plant in Nag' Hammadi in Upper Egypt in 1898. Also, at the turn of the century and in partnership with the international financier Ernest Cassel, they took over Egypt's remaining nine cane-processing factories as well as sugar estates and a network of light agricultural railways from *al-Da'ira al-Saniyya*.⁴⁹ At the present stage of research, not much can be said about the architecture of the sugar refineries that the Société Générale built. The refinery in al-Hawamdiyya still operates today, but could not be accessed. From external observation, however it is clear that the plant has been thoroughly modernized and expanded, and that the original buildings from 1881 have almost certainly disappeared (fig. 21). Of the refinery in Nag' Hammadi, there is at least a turn-of-the-century photograph (used for an early touristic postcard!) that shows the original 1897 factory complex as a vast plot with a regular arrangement of long single-story and two-story halls with relatively large rectangular windows, gable walls, and double-pitched roofs (probably in truss-construction) (fig. 22).⁵⁰ In the background are a number of higher blocks with flat roofs and three high chimneys. The architecture is plain and utilitarian, and an example of what may be referred to as late-19th-century "international industrial style." Yet, as we shall see, this plain utilitarian style was not the only one in Egypt at that time.

A wide variety of modern industries developed during this period. In addition to sugar and cotton, there were tobacco and cigarettes, cement and building materials, food products, oil and soap, clothing and textiles, fertilizers, and even mining. With the exception of the export-centered cotton, sugar, and tobacco industries, these industries catered to a growing local Egyptian market.⁵¹ As a result, a considerable number of new factories, and especially larger industrial establishments, were built during this period. The buildings themselves became larger and technically more advanced, allowing them to survive later technical adjustments, which is certainly one reason why many of them still exist today.

The examples presented here show this to be the heyday of the artful application of historicist styles for industrial ar-

opment of Egyptian Industry," *Middle East Studies* 2:4 (July 1966), pp. 293-301; and Owen, *Middle East*, pp. 220-226.

47 Robert Vitalis, *When Capitalists Collide. Business Conflict and the End of Empire in Egypt* (Berkeley: University of California Press, 1995), chapter 1.2.

48 Vitalis, *When Capitalists Collide*, chapter 1.2.

49 *Ibid.*; Owen, *Middle East*, p. 238; and Owen, "Lord Cromer," p. 293.

50 These buildings are very similar to some of the buildings at the al-Hawamdiyya plant. It would therefore appear that the oldest extant buildings at the al-Hawamdiyya plant date from the same period as the Nag' Hammadi plant.

51 Owen, *Middle East*, p. 236.



Fig. 23: al-Qanatir al-Khayriyya, Salvago Ginning Mill, gate and towers, Antonio Lasciac, 1895.



Fig. 24: Salvago Ginning Mill, director's house, Antonio Lasciac, 1895.



Fig. 25: Salvago Ginning Mill, guesthouse, after 1895.



Fig. 26: al-Qanatir al-Khayriyya, eastern gate tower of the Delta Barrage, 1862.



Fig. 27: Salvago Ginning Mill, main ginning hall with workshop block, c. 1890.

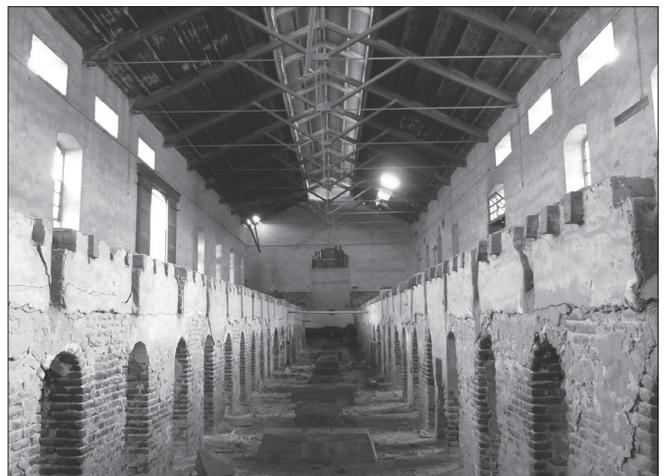


Fig. 28: Salvago Ginning Mill, main ginning hall, interior view; the main floor has been removed, rendering the substructure that used to support it visible.

chitecture in Egypt. It was also during this period that professional architects began to play a more prominent role in designing industrial buildings. Moreover, these buildings, built for powerful capitalist investors and corporations, give evidence of the rise of what I would call “corporate monumental architecture.” Such use of monumental architecture by private enterprises constituted a novel and even revolutionary phenomenon, for until then, monumental architecture had been the prerogative of the rulers and the state. These structures are a visual manifestation of the new power and self-confidence of private capital in Egypt.

The buildings of the Salvago ginning mill, a large plant built in the late-19th century by the Salvago Group at the Delta Barrages (al-Qanatar al-Khayriyya) in the Qalyub district north of Cairo provide a good example of this architecture (figs. 23–30). The mill is conveniently situated on a vast rectangular plot, bound by the Nile to the west and a nearby railway line to the east, with ample open space for the storage of cotton bales. Nationalized in the late 1950s, the mill was operative until the mid 1990s, when it was closed down and subsequently stripped of most of its equipment. In the 1930s, when it was owned by the Associated Cotton Ginners of Egypt Ltd., it operated 148 roller gins, two hydraulic presses, and a steam press, and was one of the largest ginning mills in the country.⁵² This was probably also true at the time when the mill was first built.

While the precise date of construction for the mill building has not yet been established, the completion of the administrative and gate buildings can be precisely dated to 1895, by means of a photograph from that year. They were designed by no one less than Antonio Lasciac, a Slovenian with Austro-Hungarian citizenship who was active in Egypt since 1883, and who served as chief architect of the Khedival palaces under ‘Abbas Hilmi II from 1907 until 1914.⁵³

The administrative buildings and the gate building of the Salvago ginning mill are outstanding examples of a Picturesque variation of the Castle Style. They form a loosely-connected chain of buildings along the western side of the mill

complex, overlooking the Nile and the Delta Barrages. The most striking elements are the three towers of different height and shape, built in red brick with sandstone elements, all complete with a playful combination of buttresses, arched windows, crenellations, arched cornices, battlements, corner turrets, and little connecting bridges built in a neo-Gothic vocabulary. Between two of the towers, a gate with a large pointed arch, battlements, and chain slits (for a nonexistent drawbridge) once gave access to the compound. In the second row, three administrative and residential buildings feature similar neo-Gothic details in their windows, with stone mullions, blind arches and niches, battlements, and wooden verandahs. The northernmost building of the three—the guesthouse—was built later than 1895 (it is missing in the 1895 photograph), but largely follows the model of the other buildings in its decorative details (fig. 25). It is important to remark that, from what we know, this was the only building project in an industrial context that Lasciac ever designed in Egypt. His usual fields of activity were commercial and apartment buildings, villas, and palaces. Indeed, one of the buildings at the Salvago mill was a small “villa” for the director, which may have led Lasciac to accept this exceptional project (fig. 24). His choice of the Castle Style may have been extravagant, but not at all random. The towers and gate of the Salvago mill clearly echo the nearby gate towers of the Delta Barrages, which were completed in 1862 and evidently served as Lasciac’s main inspiration and reference (fig. 26). As the structures are within eye-shot of each other, the effect is impressive.

Dating the remainder of the buildings within the compound is a more complex exercise. While the ginning mill building itself probably predates Lasciac’s administrative buildings by a decade, there are numerous annexes and auxiliary buildings, some contemporary with the main building, others added later, during the 20th century. This composite, piecemeal construction is typical for many industrial complexes in Egypt. The main building—the initial core of the plant—deserves attention as an example of a long, single-aisle hall in plastered brick masonry with a double-pitched roof in timber-truss construction. The roof trusses are structurally reinforced by iron tie rods. Light and air are provided through segmentally-arched side windows with iron sash bars and a monitor along the roof. The building shares the characteristic features of ginning mills in Egypt: the lofty and airy ginning hall is elevated on a substructure of low parallel walls with arched openings that run the length of the build-

52 *Annuaire général de l’industrie égyptienne 1938* [General Yearbook of Egyptian Industry], 1st ed. (Alexandria: Imprimerie A. Procaccia, 1938), p. 90.

53 For a brief biography of Lasciac, see Mercedes Volait, *Architectes et architectures*, p. 434. The 1895 photograph of the Salvago mill was published in *Da Gorizia all’impero ottomano: Antonio Lasciac, architetto. Fotografie dalle collezioni Alinari* [From Gorizia to the Ottoman Empire: Antonio Lasciac, Architect. Photographs from the Alinari Collection], exhibition catalog ed. by Ezio Godoli (Florence: Fratelli Alinari, 2006), p. 62. The photos of this collection were taken purposefully to document Lasciac’s buildings when they were under construction or about to be finished.

ing along the ground-floor (fig. 28). These walls served to carry the wooden main floor (which in the case of the Salvago mill has been removed), and bear the weight of the gins, which were positioned in a continuous row. The ground floor formed by this substructure also contained the seed channels (for carrying off the extracted cotton seeds coming from the gins above) and parts of the driving mechanism for the gins.⁵⁴ Other ginning mills surveyed feature the same basic layout, as with the Barakat mill in Damanhur (fig. 29). But the Salvago mill is particular in that it is actually a twin mill: the unusually long main building consists of two ginning halls with a compartment for the steam press in between.

At the western end of the hall is a four-story block with rows of segmentally-arched windows and a hip roof. All four floors, built of timber floor construction supported by cast-iron columns on the ground floor and timber posts on the upper floors, served as repair workshops. Annexes are located at the northwestern side of the ginning hall, and these still contain the steam boiler, a steam engine with an integrated electric generator (made by the Swiss company Oerlikon in 1902), and a diesel engine. The engine hall has a timber-truss roof identical to the roof of the main ginning hall, and the floors are constructed on flat brick vaults set between iron beams—providing an example of the jack arch system that became more common in Egypt at the end of the 19th century. The boiler hall is flanked by a brick chimney of decorative design, featuring a cubic base with corner pilasters and a string course in dressed stone, a long octagonal brick shaft, and a tip with broad rounded molding in dressed stone. The chimney was later reinforced with concrete bracings, which disguise its original ornamental design (fig. 30).

This and other details actually point to a number of alterations affecting the building façades. Masonry details visible at damaged spots of the plaster, and a Tuscan capital that is still visible in a hidden corner of the façade, suggest that the four-story block and possibly also the ginning halls were once externally decorated with pilasters and string courses. The present shape of the façades, with their grid of plain horizontal and vertical bands, appears to be the result of renovation work dating to the later part of the first half of the 20th century. That the main factory buildings were originally designed in a more richly-decorated historicist style is also evident from the ornamental wood-cut lambrequins that



Fig. 29: Damanhur, Abdel-Meguid Barakat Ginning Mill, early-20th century; interior view showing the original wooden floor and roller gins of the mill, which is still in use.



Fig. 30: Salvago Ginning Mill, chimney with the subsequently-added concrete bracing.

⁵⁴ For an early-20th-century description of ginning mills, see Moritz Schanz, *Cotton in Egypt and the Anglo-Egyptian Sudan* (Manchester: Kessinger Publishing, 2007 [1912]), pp. 87-91.



Fig. 31: Giza, S.A. Brasserie des Pyramides Brewery (later al-Ahram Beverages Company), c. 1900.



Fig. 32: S. A. Brasserie des Pyramides Brewery, view of western annex and central block.

have survived along the edges of the monitor roofs. Although not totally evident from what survives today, it still is clear that Salvago and his architect originally devised a factory that was not just a utilitarian structure, but also a symbol of wealth and power. Whether these buildings were also designed by Lasciac remains to be determined.⁵⁵

As the above description shows, the Salvago buildings made significantly more use of iron elements, e.g., iron sash bars, cast-iron columns, iron beams, and iron stairways, than earlier industrial buildings identified in this survey. This indicates that such prefabricated industrial materials—whether imported or locally produced—were gaining increasing currency in Egypt's factories at the end of the 19th century.

55 The style of the main mill buildings is not typical of Lasciac's work.

A second example of "high" industrial architecture with an even more pronounced monumental character is the al-Ahram (or the so-called Stella) brewery in the Bayn al-Sarayāt neighborhood of Giza (figs. 31–33). This plant was erected at the beginning of the 20th century on a vast plot formerly occupied by the palace and gardens of Prince Hasan Pasha.⁵⁶ The founder of the plant was the Belgian–Egyptian Société anonyme Brasserie des Pyramides, established in 1898 under the directorship of Chakour Pacha, L. Carton de Wiart, Alfonso Colucci, and J. Debome, and run with mainly Belgian capital, equipment, and know-how.⁵⁷ Later transformed into the Bomonti & Pyramids Beer Company, in 1953 it was renamed al-Ahram Beverages Company, retaining the Arabic word for pyramids. Throughout this time, its most famous product was Stella beer. A holding company currently owns the plant; it is no longer in use, has been stripped of its equipment, and is awaiting an unclear fate.

Although no information about the designer of this plant has been found yet, it appears that, as was the case with the Salvago ginning mill, he was an architect. The main building of the original plant—as far as is discernible from among later additions—is a broad, almost symmetric composition of cubic masses stretching along an east–west axis. It consists of a three-story central block flanked by lower two-story blocks on either side. A pair of rectangular towers with battlements frames the central block, and two similar, but lower, towers flank the building at both ends, giving the plant a monumental fortress-like appearance. This character is enhanced by the rubble-stone masonry combined with horizontal courses of brick, the shallow arched niches articulating the façades, and the use of battlements projecting on arched corbels similar to machicolations. When viewed in combination with the superimposed rows of rectangular and arched windows in the central block, the whole building looks like a crossover between Byzantine palace and Tuscan castle architecture. In an intriguing contrast to its leisure and entertainment-related products, the plant's overall posture is serious, austere, and "self-important," especially when compared to the Picturesque Salvago factory. This ambitious gesture is

56 The palace is shown on the *Plan général de la Ville du Caire et des environs*, published by the Ministry of Public Works in 1897. The *Indicateur égyptien* of 1908 shows the brewery in this location; see *Indicateur égyptien* 1908, ed. Stefano Poffandi (Alexandria: Imprimerie générale A. Mourès & Co., 1908), p. 92.

57 *Indicateur égyptien*, p. 92. Regarding the history of the company, see Samir Raafat, "Stella's Grandpa, 1897–1947," originally published in *Egyptian Mail*, Saturday, June 14, 1997; available online at <http://egy.com/historical/>, accessed June 2010.

underlined by the fact that, in its early years, the brewery must have been conspicuously higher than the remaining Khedival palaces in the neighborhood. It was, and still is, a landmark building.

As the interior of the buildings could not be accessed yet, it is difficult to assess their internal constructional features and functional layout. Of great interest, however, is the reinforced-concrete floor construction of the central block's lower floors. If these are the original floors (which is very possible, but needs substantiation), then their shape and some of their exposed hoop-iron stirrups would indicate that this is one of the early examples in Egypt of concrete construction in the Hennebique system, which was patented in 1892 by François Hennebique, and is considered a precursor to the modern reinforced concrete method of construction. It also would be the earliest known example of its use in industrial architecture in Egypt.⁵⁸

Historicist designs of high quality—probably by architects—were not limited to private-sector factories or corporate architecture. They are found as well in railway buildings and workshops such as the railway telegraph stores in Cairo's Sabtiyya district, built in the first decade of the 20th century (figs. 34–35). The buildings combine austere façades of undressed stone and brick along the street with ornamental plaster façades towards the interior of the site, especially on the northern side of the rectangular building, where the office rooms are located on two floors.⁵⁹ The remainder of this



Fig. 33: S. A. Brasserie des Pyramides Brewery, close-up view of central-block facade.

58 There are a few references to the use of the Hennebique system around the turn of the century in Cairo. The contractor Nicola Marciano, who worked with Antonio Lasciac on the construction of the palace of Prince Sa'ïd Halim (1896–1899), is known for being the first to build in reinforced concrete and for being the local agent for the Hennebique system. See, Marco Chiozza and Silvia Bianco, "Antonio Lasciac: Architettura e identità," in Ezio Godoli (ed.), *Da Gorizia all'impero ottomano*, p. 22. The same Marciano is said to have built the reinforced-concrete cupola of Cairo's Egyptian Museum (1896–1899); and the Hennebique system was amply used in the construction of the Heliopolis Palace Hotel (1905–1908)—a result of cooperation between the Belgian industrialist Edouard Empain, the Belgian architect Ernest Jaspar, and the construction firm Padova, Rolin & Cie. (See, Anne van Loo, "Ernest Jaspar à Héliopolis, 1905–1916," in Mercedes Volait (ed.), *Le Caire – Alexandrie: Architectures européennes, 1850–1950* (Cairo: CEDEJ/IFAQ, 2004), p. 124. The spread of concrete construction was also facilitated by the gradual establishment of cement factories in Egypt, the first being the factory of the Belgian firm Société anonyme des ciments d'Égypte in Masara south of Cairo, founded in 1900. It is possible that this Belgian connection played a role in the use of reinforced concrete for the al-Ahram brewery.

59 The 1897 *Plan général de la Ville du Caire et des environs* shows an empty plot in this location. The 1914 Cairo map of the Survey Department (see, Marcel Clerget, *Le Caire: étude de géographie urbaine et d'histoire économique [Cairo: A Study of Urban Geography and Economic History]*, 2 vols. (Cairo: Schindler, 1934), vol. 1, map 4) shows the buildings and identifies them as "Telegraph stores."

building is an early example of a large hall with a north-light roof in metal construction. This was a novel roofing type for industrial buildings in Egypt that allowed for larger covered surfaces with sufficient lighting and ventilation. Although earlier examples still need to be identified, it is clear that north-light or saw-tooth roofs were increasingly applied in numerous variations in subsequent decades.

Another one of the many examples of historicist designs, this time in public works, is the old pump house for the Giza waterworks, reportedly built in 1896 (fig. 36). It is an elegant cubic neo-Renaissance building in red-brick masonry combined with ornamental yellow stone elements, and covered with a metal-truss roof.⁶⁰ The choice of a neo-Renaissance vocabulary was more common for residential buildings, but rather exceptional for an industrial structure, and might be

60 The building is shown in the 1897 *Plan général de la Ville du Caire et des environs*. The date 1896 was given by the manager of the plant during the site visit, but still needs to be confirmed.



Fig. 34: Cairo, Sabtiyya District, Railway Telegraph Stores, beginning of the 20th century; view of the western street facade.



Fig. 35: Railway Telegraph Stores, view of northern facade.

connected to the water-works' proximity to the Giza palaces and gardens.

While the buildings described above may all be classified as examples of "high architecture," a leather tannery on Ma-jra al-'Uyun Street in Cairo's 'Ayn al-Sira neighborhood pro-

vides a vernacular example of industrial architecture from this period (fig. 37). Because of the grand slaughterhouse located in the vicinity, this area became a preferred location for leather processing industries in the late-19th century. The leather tannery described here was built in 1907.⁶¹ It is a long, relatively plain two-story building with two internally-separated blocks flanking a central gateway. The masonry technique used here—rubble-stone masonry combined with brick and / or ashlar masonry for the corners as well as for the door and window frames—is identical to that used in the al-Ahram brewery and the railway telegraph stores, and may be considered characteristic of the period. Also noteworthy is the ample use of iron double-T beams for the window lintels as well as for the jack arch floors and ceilings of most rooms. This modern technique, however, stands in peculiar contrast to another ceiling type found in the building's large upper-floor hall, where cast-iron columns carry a simple framework of double-T steel girders as a substructure for an almost "primitive" ceiling built from roughly-sawn timber joists, wooden panels, and a top layer of mud— the same materials and technique used in factories from the Muhammad 'Ali period. In contrast to the "high-architecture" buildings described above, this example illustrates the combining of advanced and rather primitive construction methods that characterized vernacular industrial buildings of the period.

Regarding vernacular forms of industrial architecture, there is a particular arrangement that became popular in Egypt from the early 20th century onward. It might be referred to as the "*ambar* with street façade" arrangement, and combines a decorative street façade (its architectural style depending on the time of construction as well as on the preferences of the clients and builders) with a *'ambar* (the local term for a single-story workshop hall) of plain utilitarian design covered either by a truss or concrete roof. This arrangement, ubiquitous throughout the cities of Egypt, is found in various sizes, and is incorporated in a wide range of building types, whether large railway stations and warehouses, or carpenters' workshops and car garages. One of the numerous examples found through this study is the Spiro-Spathis soft-drink factory in Cairo's Bab al-Hadid district south of the Ramsis Railway Station, in what today is part of Downtown Cairo (figs. 38–39). Initially built in the first decade of the 20th century, it was reportedly purchased by the Greek entrepreneur Spiro Spathis in the 1920s, after which

61 This is according to a document shown to us by a member of the family that owns the building and who still has an office in it.



Fig. 36: Giza, Waterworks, pump house, 1896.



Fig. 37: Cairo, 'Ayn al-Sira District, Leather Tannery on Majra al-'Uyun Street, 1907.



Fig. 38: Cairo, Bab al-Hadid District, Spiro Spathis Soft-Drinks Factory, first decade of the 20th century; view of street facade.



Fig. 39: Spiro Spathis Soft-Drinks Factory, interior view of the 1926 addition showing stone columns and monitor roof.

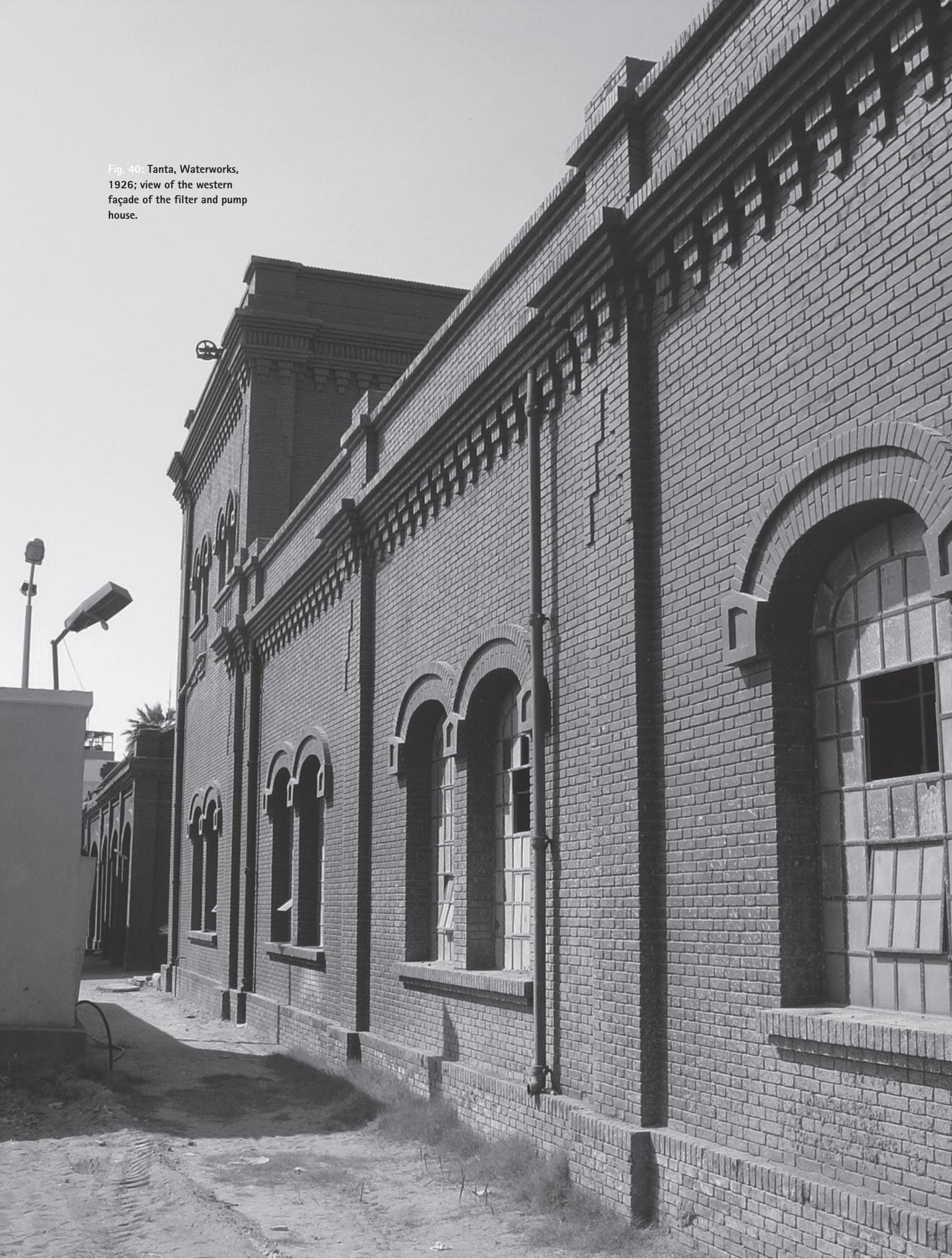
the building was obviously altered and enlarged towards the rear.⁶² The original façade is of plastered brick featuring neo-Classical decoration, and behind it is a rectangular hall with brick walls and two rows of stone pillars carrying double-T girders as a bearing structure for what today is a flat reinforced-concrete roof with a monitor above the central aisle. The ground floor is taken up by mixing and filling machines and by storage space, while offices and laboratory rooms have been inserted as mezzanines in the front and central parts of the building.

The examples shown demonstrate that even though the

period from the 1890s until the First World War is considered one of relatively slow industrial growth, industrial architecture in Egypt then experienced very important, almost revolutionary developments. These include the introduction and popularization of new materials, construction techniques, and building types that were to determine future developments for decades to come. Also important is the appearance of "high-architecture" plants, and the increasing use of industrial buildings as a conscious means of public self-representation by companies and entrepreneurs. This new effort not only found material expression in the design of the buildings, but even in the use of factory building images on postcards, as in the case of the Nag' Hammadi sugar refinery. In-

⁶² This chronology is based on information provided by a daughter of Spiro Spathis.

Fig. 40: Tanta, Waterworks, 1926; view of the western façade of the filter and pump house.



dustrial architecture in Egypt had moved out of the margins to take a more central and self-confident position in architectural production and public perception.

1914 to 1956: Modernism and the factory as a machine

The First World War had a stimulating effect on Egypt's industrial development. The limited availability of imports and capital from Europe, together with the increased presence of British troops, triggered a higher demand for local production. After the end of the war, the independence movement of 1919 and the British declaration of a (formally) independent Egypt in February 1922 led to the establishment of a constitutional government under the Wafd Party in 1923. The new leadership was composed not only of the administrative and professional elites formed during the period of British colonial rule, but also of wealthy landlord-capitalists of the pre-war period in addition to some newcomers who had gained their wealth only recently from wartime opportunities and were keen on investing in the industrial sector.⁶³

The 1918 report of the Sidqi Commission on Commerce and Industry (initiated by two influential newcomers, the politician Isma'il Sidqi and the businessman Tal'at Harb) had for the first time identified economic and industrial development as a major element in the struggle for national reform and independence. As a result, a peculiar mixture of high-flying nationalist aspirations and straightforward business interests worked together to provide a framework of political, institutional, and financial support for the development and diversification of local industries. In 1920, Bank Misr was established under the leadership of Tal'at Harb, with the aim of raising Egyptian capital for developing Egyptian enterprises, and to curtail the dominant role of foreigners and local foreigners in banking, commerce, and industry. In 1922, a law governing industrial loans was enacted. The same year saw the foundation of the Association of Industries, later renamed the Federation of Egyptian Industries. In view of the role of nationalism in the political discourse of the day, it is important to note—as Robert Vitalis points out—that the membership of the Association comprised not only Egyptians, but equally involved “local foreigners” like Salvago and Surarès, and foreigners like Baron Empain. The Association thus served as a platform for the local oligarchy of entrepreneurs

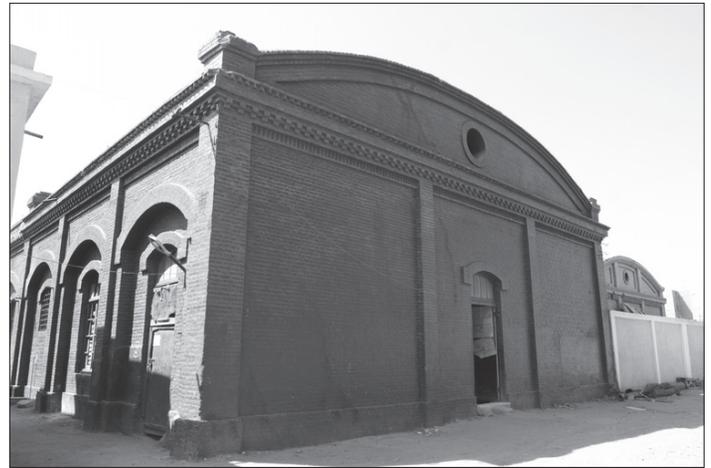


Fig. 41: Tanta Waterworks, ice factory.

to monitor developments, mediate tensions, encourage collaboration between competitors, preserve privileges and monopolies, and secure cooperation in the face of rising labor militancy. It is also important to note that, as a matter of course, personal business interests and recourse to foreign capital and transnational business partnerships—whether obvious or behind the scenes—continued to play a role in the industrial endeavors of both the so-called “nationalist” and the so-called “comprador” businessmen alike until the 1950s.⁶⁴ In the eyes of a contemporary Marxist observer, Tony Cliff, Egypt's industry came to be fundamentally characterized by its concentration of enterprises, a tightening mutual dependence between them, the rule of finance capital, a large share of foreign capital, and the merging of finance capital with the state.⁶⁵

The industrial growth of the period is reflected in the size of the industrial labor force, which rose from a rather insignificant quarter of a million in 1919 to over one million in

63 P.J. Vatikiotis, *The History of Modern Egypt: From Muhammad Ali to Mubarak*, 4th rev. and enl. ed. (London: Weidenfeld & Nicolson, 1991), pp. 255–256 & 261.

64 For a critical overview of developments from this period that also discusses the controversial issue of the construed juxtaposition of Egyptian national(ist)s versus foreign capitalists, see Vitalis, *When Capitalists Collide*, esp. chapter 1.2.; and—more generally—Robert Owen and Şevket Pamuk, *Middle East Economies in the Twentieth Century* (London: I.B. Tauris, 1999), chapter 1.2. Regarding the role of foreign capital, see also, Farghali Tusun Haridi, *al-Ra'smaliyya al-Ajnabiyya fi Misr (1937-1957)* [Foreign Capital in Egypt], 2 vols. (Cairo: al-Hay'a al-Misriyya al-'amma lil-Kitab, 2002). For a contemporary official perspective, see, “Egypt's Industrial Expansion (by the Ministry of Commerce and Industry),” in Demetrius A. Zoides (ed.), *Egypt Today: Its Finance, Industry, and Commerce* (London: Bemrose, 1939), pp. 90–93.

65 Tony Cliff: “Industry and Banking in Egypt” (1946), first published in Tony Cliff, *International Struggle and the Marxist Tradition, Selected Works*, vol. 1 (London: Bookmarks, 2001), p. 1; available online at <http://marxists.org/archive/cliff/works/1946/arabeast/egypt.htm>, accessed June 2010.



Fig. 42: Tanta Waterworks, ice factory, overhead view of the cylindrical "shell" roofs.



Fig. 43: Tanta Waterworks, interior of the filter and pump house.

1939, and to almost two million in 1952.⁶⁶ Since many of the factories established during the period were highly mechanized, this growth must also be explained by the sheer number of new industrial establishments and the expansion of existing ones. In any case, many of the industrial buildings examined for this study date from this period. They clearly constitute the bulk of Egypt's industrial heritage, and count among them some very impressive and elegant designs.

In terms of architectural development, the period was

66 Even against the backdrop of accelerated population growth (9.7 million in 1897, 15.9 million in 1937, and over 20 million in 1957), this increase in industrial labor force remains considerable. For the numbers, see, Vatikiotis, *History of Modern Egypt*, pp. 315 & 326.

generally marked by what Mohammad Awad has called the transition "from historicism to modernity," or as I would prefer, from historicism to modernism.⁶⁷ This may be even truer for industrial architecture than for the residential, commercial, and public buildings for which this expression was mostly intended. This survey indicates that in factory architecture, the use of historicist styles continued until the late 1920s, when it began to be replaced by pronouncedly-modernist vocabularies—including variations of the International Style, with occasional Art Deco influences that may be observed until the 1940s.

The continuation of historicist styles through the 1920s and even into the early 1930s may be illustrated by two examples. The first is the waterworks of Tanta, a city in the Gharbiyya district of the Delta (figs. 40–43). According to a surviving marble plaque, they were built in 1925 by the *muhandis* (engineer or architect) Muhammad 'Irfan Bey and the building contractor Taverna. Muhammad 'Irfan had studied in Birmingham before the war, and later taught urban planning and municipal engineering at Cairo's Polytechnic School (later incorporated into Cairo University as its Faculty of Engineering). Between 1925 and 1929, he headed the Administration of Municipalities and Local Commissions.⁶⁸ Whether he or the contractor Taverna should be considered the actual architect of the waterworks, remains unclear. The complex is mainly composed of three long buildings, two parallel to each other on the northwestern end of the plot, and one in the southeastern extension, running alongside a row of circular sedimentation tanks. All buildings are built in red-brick masonry with façades featuring decorative brick elements like pilasters, arched windows, blind arches, and projecting cornices. While the use of a historicist style was conventional then, the novelty of these buildings lies in their innovative roof construction. The two parallel halls in the northwest (one of them once was an ice factory, but the initial function of the other could not be clarified yet) are covered by long cylindrical shell roofs of reinforced concrete, with arched concrete ribs projecting on the outer and inner side of the shell, and iron tension-rods connecting the ends of the ribs in the interior of the hall. Although technically this is not truly

67 Mohammad Awad, "From Historicism to Modernity (the Inter-War Period, Alexandria 1918–1939): The Italian Connection," in Ezio Godoli and Milva Giacomelli (eds.), *Architetti e ingegneri italiani in Egitto dal diciannovesimo al ventesimo secolo / Italian Architects and Engineers in Egypt from the Nineteenth to the Twenty-First Century* (Florence: Maschietto Editore, 2008), pp. 141–151.

68 On 'Irfan, see, Volait, *Architectes et architectures*, pp. 287 & 417.

a shell structure, but a barrel-vaulted roof supported by integrated concrete-and-iron trusses, this solution was nevertheless experimental within the Egyptian context, and advanced even within an international context.⁶⁹ The third building in the southeastern extension, which still serves its original function of a pump and filter-house, is structurally less extraordinary and represents standard features of the period: the two-story tower-like pump-house contains a reinforced-concrete framework of column and girder-supported slabs; the attached long and narrow filter hall has a mezzanine floor in steel-framework construction and a steel-truss pitched roof.

The second example, the generator hall in Tanta, in fact originally belonged to the city's waterworks complex described above and is located on an adjacent plot further north (fig. 44).⁷⁰ The building—which has been decommissioned—is simply referred to as *wabur al-nur*, a term that literally denotes a steam engine for electricity production, and by extension the building that houses it. With the electrification of Egyptian cities in the early 20th century, such generator halls appeared as a new building type. Examples—usually built in historicist styles—are also found in Cairo's Shubra district and in al-Mahalla al-Kubra. The generator hall of Tanta stands out among these buildings as an example of striking monumentality and beauty. Built in 1931, the rectangular hall of red brick masonry with a pitched steel-truss roof is structurally conventional. But the use of elements like the large corner pillars framing the gabled façade, the enormous brick arch with its large yet plain keystone, the "oversized" but simplified cornice with dentils and a frieze of blue ceramic tiles, or the pair of pilasters with Art Deco pinnacles that dominate the center of the western façade looking onto the main road, all produce a building that hovers between machine hall and temple architecture. It is, at the same time, reminiscent of mid-16th-century Renaissance shipyard buildings like the Medici arsenals in Pisa, and the monumental late-18th-century Classicism of a Claude-Nicolas Ledoux or Friedrich Gilly. The conspicuous use of Art Deco elements, though, announces a move towards Modernist architecture

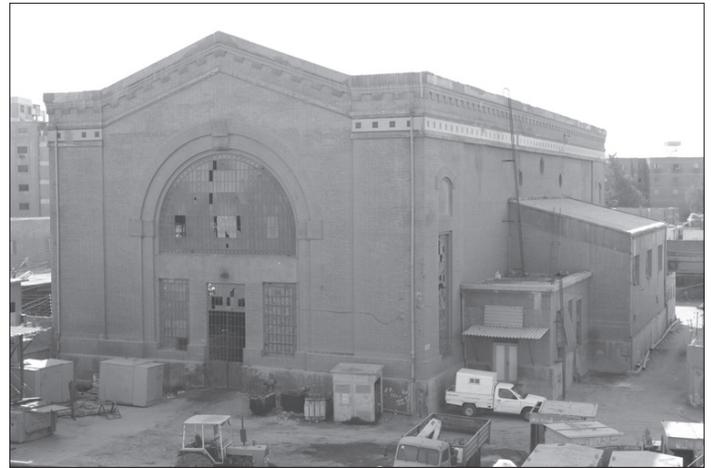


Fig. 44: Tanta, Generator Building, 1931.

that was fully underway when the generator hall was built.

The identity of the architect who designed this admirable structure unfortunately has not yet been established.

A crucial factor in the development of industrial architecture during this period was the increasing involvement of professional architects. They were often Egyptians or Syrian migrants to Egypt, many of whom were trained abroad and served as vectors for the introduction and adaptation of new techniques and architectural fashions in Egypt. The growing engagement of Egyptian architects is documented by illustrated articles on factory buildings published in the Egyptian architectural journal *al-'Imara* ("Architecture"), an Arabic-language publication that first appeared in 1939.⁷¹ The (admittedly few) factory buildings presented in this journal are all examples of Modernist and functionalist architecture which the journal emphasized, but also reflect the practical dominance of this approach over industrial architecture from the 1930s onward. The Cairo and Zürich-trained architect Sayyid Karim (a.k.a. Kurayyim, the founder and editor of *al-'Imara*), and even more so, the Cairo and Liverpool-trained 'Ali Labib Gabr, both famed architects of the Egyptian Modernist movement, must be mentioned as important contributors to Egyptian industrial architecture of the period who made ample use of the journal to publicize their work, and who as teachers at the Engineering Faculty of Cairo Univer-

69 Regarding the development of actual cylindrical shell roofs, which were first used in 1906 in Germany, and gained wider usage beginning in the late 1920s, see, Peter Morice and Hugh Tottenham, "The early development of reinforced concrete shells," in Mike Chrimes, Dawn Humm, and James Sutherland (eds.), *Historic Concrete: background to appraisal* (London: Thomas Telford, 2001), pp. 165-175, esp. pp. 170-172.

70 While the waterworks still belong to the Tanta Water Company, the generator hall is at present owned by the regional electricity company Shirkat Janub al-Delta.

71 On this journal and the background of the editors and authors—most of whom had received their training in architecture or civil engineering in Europe—see Mercedes Volait, *Architectes et architectures*, p. 295; and, by the same author, *L'architecture moderne en Égypte et la revue al-'Imara (1939-1959)* (Cairo: CEDEJ, 1988).

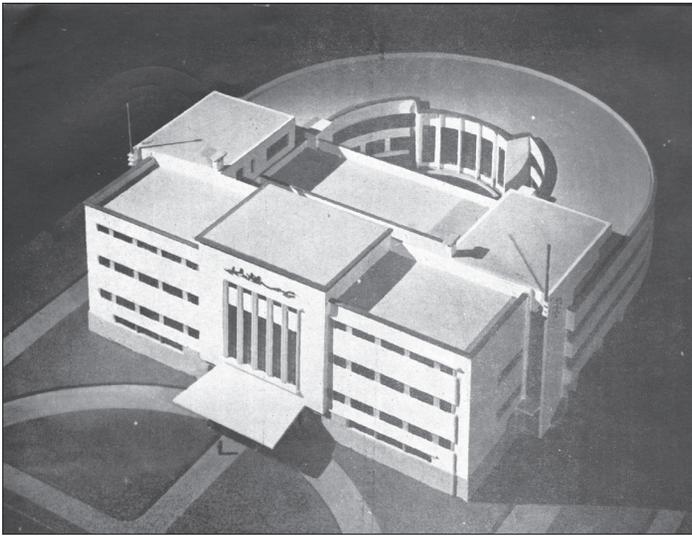


Fig. 45: Proposed design for the Misr Factory for Tobacco and Cigarettes, Sayyid Karim, 1941.

sity also influenced numerous future architects.⁷²

As illustrated by a 1941 article by Sayyid Karim on the building he planned for the Misr Factory for Tobacco and Cigarettes (figs. 45–46), the turn to Modernism was not just one of aesthetic choices, but also of planning concepts (although it remains to be determined as to how far this was really a change in the planning process rather than a change in how this process was discursively framed). Karim's article was the journal's first to present a factory building, and therefore takes a programmatic tone. It proclaims that architects have left behind their former image of "artists" and have taken over the task of designing factories, which was hitherto the domain of engineers. "Designing a factory," he continues, "is like designing a machine," and he substantiates this by a series of plans of his tobacco factory that include flowcharts rendering the movement of raw material and products through the plant. The design anticipates future extensions in line with the processing flow, and with attention to the spatial separation of the movements of goods, workers, management staff, and visitors.⁷³ In addition to the explicit concern for a functional layout, the design implicitly shows other concerns. The symmetric administrative block at the front, with its elevated central part featuring a large window front with pillars resembling a portico, a flying roof over the main entrance, and a semicircular driveway in front of it, may be interpreted as a Modernist translation of the *corps de logis* of

a palace—a new form of the already-observed public display of corporate power and identity. The building's pronouncedly Modernist look, with its continuous horizontal window ribbons and the semicircular workshop structure to the rear of the administrative block, communicates images of progress, of a technologically-advanced culture, and of active participation in the modern world. Finally, the inclusion of an employee clubroom on the central block's upper floor, right above the second-floor reception and exhibition space, also speaks of an interest in social reform—at least in the provision of services to employees. All these were aspects of the modern industrial identity that factory buildings in Egypt now came to represent.

In this context, it is interesting to observe that the architectural styles commonly associated with the Egyptian nationalist movement and their identity politics during this period, namely the neo-Mamluk and neo-Pharaonic styles, played no role in industrial architecture—despite the fact that industrial development was a key element in nationalist politics.⁷⁴ A tentative explanation for this apparent discrepancy might be that the Egyptian architects hired by Egyptian industrialists for building their factories had at this point already appropriated the Modernist style as their own, and considered it the most appropriate and fitting style for Egypt, especially for its factories. Even pronouncedly-nationalist businessmen like Tal'at Harb, who gave the name "Misr" (Egypt) to most of his enterprises, seem to have been in full agreement—as illustrated by the above-described Misr Factory for Tobacco and Cigarettes, or the giant Misr Spinning and Weaving Company in al-Mahallat al-Kubra, which was founded in 1927 and whose original buildings and numerous later extensions were all designed by 'Ali Labib Gabr along Modernist lines (fig. 47).

A few examples shall serve to illustrate the trends of the period. At a smaller scale, there are the extensions to the ginning mill of Abdel-Meguid ['Abd al-Majid] Barakat in the Delta city of Damanhur (figs. 29 & 48–49). They were built after the older ginning mill was purchased by Abdel-Meguid's father, Ibrahim Barakat, in 1934. Not all extensions of the period have survived (a cotton weaving mill built in 1935 was recently demolished), but what is left shows a clear taste for Modernist design. The director's villa at the western end of

72 For short biographies, see Volait, *Architectes et architectures*, p. 412 ('Ali Labib Gabr) and p. 421 (Sayyid Karim / Korayem).

73 Sayyid Karim, "Masna' Misr lil-Dukhkan w'al-Saga'ir / Fabrique de tabak et de cigarettes Misr," *al-'Imara*, no. 1 (1941), pp. 9–16.

74 One notable exception is the waterworks in Kafr al-Zayyat belonging to the Ministry of Irrigation, which are designed in a remarkably plain and austere neo-Pharaonic style. The complex apparently dates from the first quarter of the 20th century.

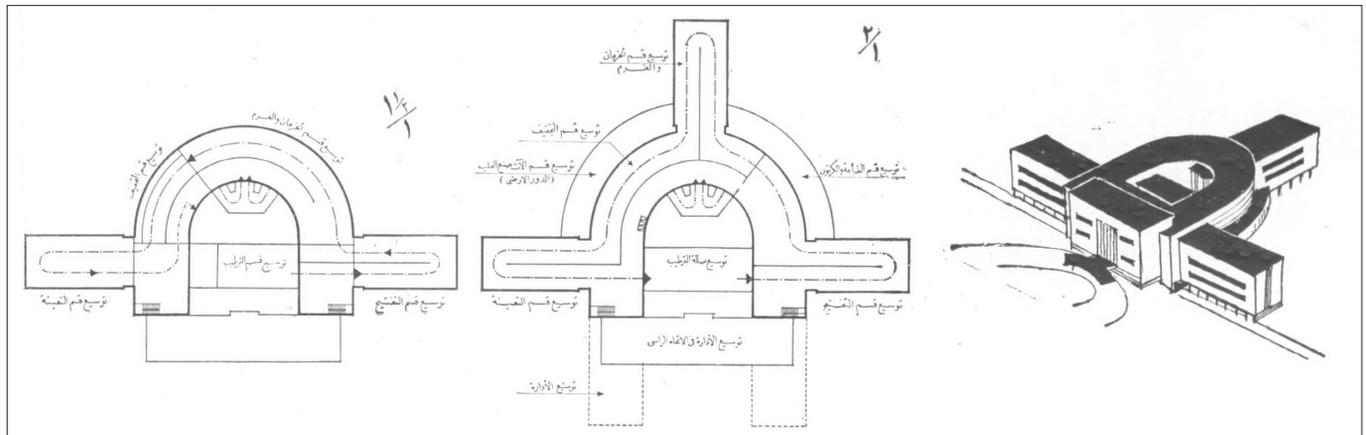


Fig. 46: Proposed design for the Misr Factory for Tobacco and Cigarettes, drawings showing anticipated extensions.

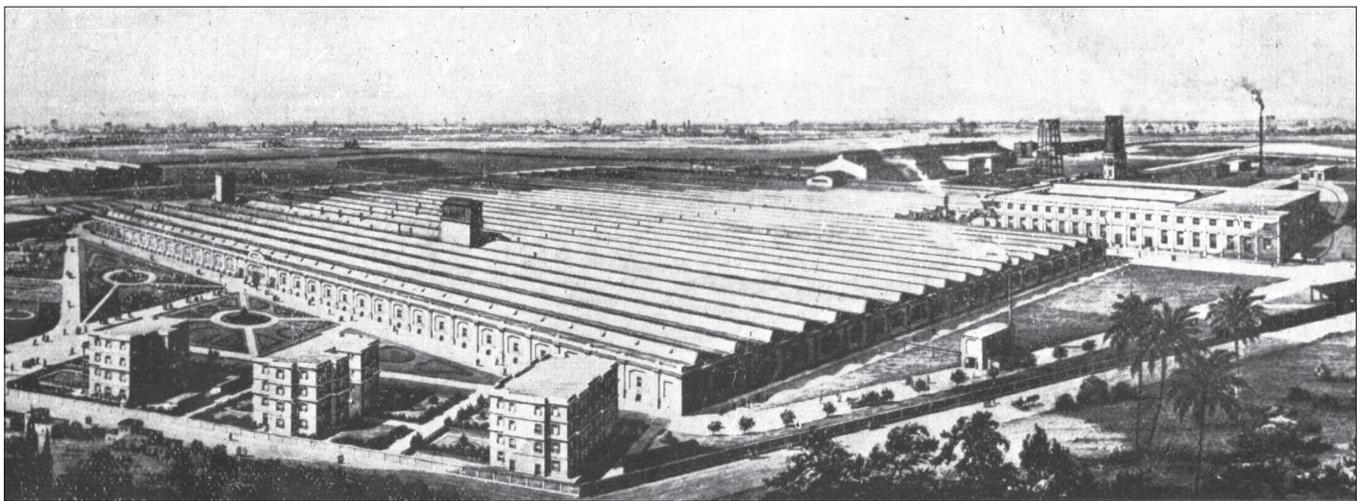


Fig. 47: al-Mahalla al-Kubra, Misr Spinning and Weaving Company, 'Ali Labib Gabr, 1927 and later; bird's-eye illustration used for a 1939 advertisement.

the plot is an Art Deco design of the mid 1930s.⁷⁵ In the mid-1940s, a Modernist, long two-story building was erected along the curve of the plot's western and northern boundaries, with shops on the ground floor (accessible from the street) and housing units for employees on the upper floor. Including a director's villa on the factory site was not unusual during this period, especially in cases where the owner lived elsewhere (Ibrahim Barakat, for instance, was a resident of Alexandria), and thus needed to be present at the factory for certain periods or seasons, and also required appropriate space for receiving business partners and clients.⁷⁶ Such vil-

75 A photo from before the additions carried out in the 1930s shows a villa in this location, which was either replaced by the present building or was heavily refashioned.

76 Another contemporary example is 'Abbud Pasha's villa on the site of his Cotton Spinning and Weaving factory in Alexandria's Nuzha district (presently

las are therefore more likely to be found in connection with factories located in areas outside the main urban centers of Cairo and Alexandria.

Housing for employees also came to be an element of increasing importance during the period. The units at the Barakat ginning mill contain a number of two- and three-room apartments with bathrooms, as well as single-room apartments with shared sanitary facilities, all accessed from an open balcony running along the length of the building. In

Shirkat Iskandariyya lil-Ghazl w'al-Nasij). 'Abbud Pasha's main residence was in Cairo's Zamalek district. At the present stage of research, it cannot be determined how far this phenomenon goes back in time. Earlier examples identified so far are the villa belonging to the Salvago ginning mill (as part of the buildings designed by Lasciac in 1895) and another small villa belonging to the ginning mill of Khalil Pasha al-Jazzar (now al-'Arabiyya Company for Cotton Ginning) in Shibin al-Kum that may be approximately dated to the turn of the century.



Fig. 48: Damanhur, Abdel-Meguid Barakat Ginning Mill, director's villa, mid-1930s.



Fig. 49: Abdel-Meguid Barakat Ginning Mill, housing block for employees, mid-1940s.

some cases, large workers' housing projects were realized in the vicinity of large factories—as for instance at Tal'at Harb's Misr Company for Spinning and Weaving in al-Mahalla al-Kubra, and 'Abbud Pasha's sugar refinery in al-Hawamdiyya. As Mercedes Volait has argued, this had to do with the urgent need to provide housing for a quickly-growing number of workers, especially in provincial cities that experienced unprecedented industrial development. But it also has to be seen within the context of the government's efforts to defuse the critical degree of worker and labor union activism, particularly in urban centers like Cairo and Alexandria. For the pur-

pose of this containment policy, the targeted development of new industrial centers away from these two cities, and state-funded workers' and social housing projects went hand in hand—especially beginning in the late 1930s.⁷⁷

A large-scale example of Modernist industrial architecture is the factory complex of the Filature Nationale d'Égypte in the Muharram Bey district of Alexandria (figs. 51–54). This former agricultural area in the south of the city, stretching along the southern side of the Mahmudiyya Canal, began to be developed as one of the major industrial areas of Alexandria in the early 1930s. At that time, the Filature Nationale d'Égypte (known in Arabic as al-Shirka al-Ahliyya lil-Ghazl wa'l-Nasij) was the oldest and largest integrated textile combine in Egypt, having been constituted in 1911 as the successor of the Anglo-Egyptian Spinning & Weaving Company originally founded in 1899. Its president was the ubiquitous Michel C. Salvago, a leading figure of Egypt's Greek community and head of numerous other companies. The director was the Swiss-born Linus Gasche, reputedly the foremost textile specialist in Egypt. The company's management was internationally composed.⁷⁸ The company's first factory compound was located on the northern side of the Mahmudiyya Canal in the Karmouz district, further west (fig. 50).⁷⁹ The new works in Muharram Bey were built in 1934, when the Filature Nationale entered into a joint venture with the British firm Calico Printers to form the Société Égyptienne des Industries Textiles, an integrated cotton spinning, weaving, and printing enterprise.⁸⁰

The new complex initially contained buildings for the weaving and printing activities, an office building, a small hospital, a gatehouse, and a power station (the later extensions built in the 1960s will be addressed below). The weaving and printing workshops are three long, cubic, three-story blocks arranged in parallel rows and interconnected by "bridge-buildings" across the thoroughfare between the blocks. They are built completely in reinforced-concrete framework construction, with large continuous workshop halls on each floor, and continuous window ribbons articu-

77 For a comprehensive discussion of this issue, see Mercedes Volait, *Architectes et architectures*, pp. 333–344, esp. pp. 336–337.

78 See, *Annuaire Générale*, pp. 100 & 104–105; and Robert Tignor, "British Textile Companies and the Egyptian Economy," *Business and Economic History*, 2nd series, no. 16 (1987), p. 58.

79 This factory complex was recently demolished to make room for a residential development—a fate that threatens many factories currently being privatized and subsequently shut down.

80 Tignor, "British Textile Companies." Tignor mistakenly locates the new factory in Karmouz.

lating the plain façades. These buildings' plain utilitarian and almost monotonous appearance is counterbalanced by the administration building, which is directly attached to the factory's middle block. It is a four-story structure of basically the same design and construction technique, but stands out with its rounded corner and with its staircase and elevator-tower rising proudly over the whole complex, carrying the emblem of the company, and ending in a ribbed Art Deco pinnacle with flagpole. The offices on each floor are divided into spacious and bright open-plan offices for staff, and separate large office rooms with anterooms for managers—a pattern of "functional" segregation found in a number of other factory administration buildings of the period, and an interesting subject for further research. A novel concern for providing social services to the workforce is shown in the hospital: a smaller single-story building of very plain Art Deco design. Whether this factory complex was designed or built by British engineers, as reported by an older leading employee of the company, or in cooperation with a local architect still needs to be ascertained.

In any case, the contrast between the pronounced Modernist design of these 1934 buildings and the historicist design of the 1926 waterworks or the 1931 generator hall in Tanta vividly demonstrates the extreme shift that industrial architecture in Egypt had undergone within a few years. But if the Filature Nationale complex appears functionalist, the buildings of the following example—also located in Alexandria—pushed functionalism to its bare essence.

The Société Générale de Pressage et de Dépôts was the oldest establishment in Egypt specialized in cotton pressing and storage (figs. 55–56). Founded in 1889, the company absorbed the younger Deutsche Baumwollpresse A.G. (German Cotton Press) after the First World War to become the largest pressing company in Egypt, with its management composed mainly of British and German nationals.⁸¹ Its main installations consist of a group of three extensive building blocks along both sides of the Mahmudiyya Canal in the Minat al-Basal district of Alexandria, close to where the canal connects to the basin of the Western Port. Two of the buildings, lining the canal's eastern side, were completed in 1936, apparently replacing older installations.⁸² The third building on the western side of the canal, following the same plan and design, was erected in 1956, after the company had been na-

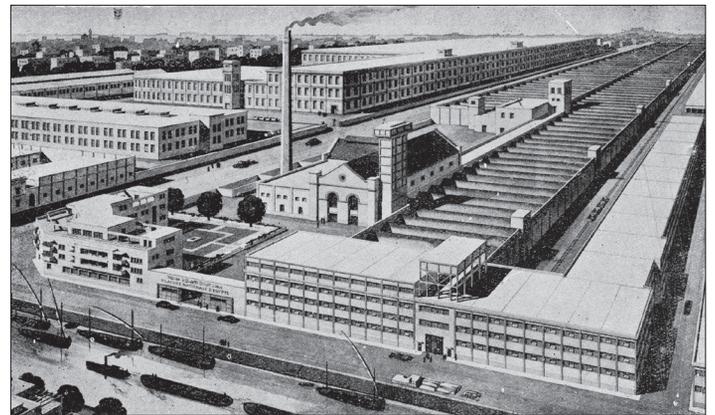


Fig. 50: Alexandria, Karmuz District, Filature Nationale d'Égypte, old works, established in 1911, with later extensions.

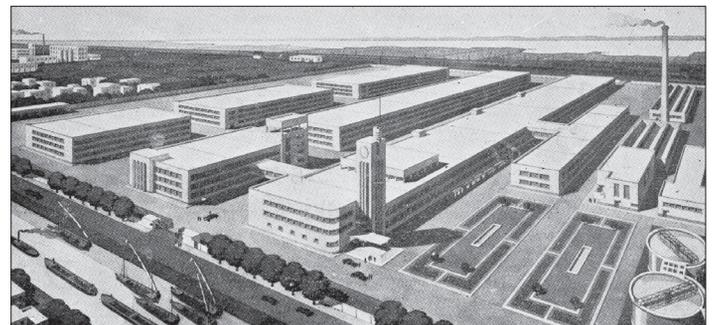


Fig. 51: Alexandria, Muharram Bey District, Filature Nationale d'Égypte/Société Égyptienne des Industries Textiles, new works, 1934.



Fig. 52: Filature Nationale d'Égypte, new works, view from the north.

81 See, *Annuaire Générale*, pp. 94 & 95.

82 The 1938 *Annuaire Générale*, p. 95, reports that the company "finished the rebuilding of its two largest buildings two years ago."



Fig. 53: Filature Nationale d'Égypte, new works, western factory block and office building with elevator tower.



Fig. 54: Filature Nationale d'Égypte, new works, interior view of factory hall.

tionalized.⁸³ The buildings, which were decommissioned a few years ago, are reportedly used by other companies for various storage purposes, and therefore could not be accessed from the interior. From the exterior, however, one observes three-story blocks in concrete-frame construction, with visible columns and girders articulating the façade as a grid filled with red-brick walls. Instead of window ribbons, the complex includes evenly-spaced small transverse rectan-

gular windows on the lower floors and upright oblong windows on the upper floor. The only elements that stand out from this grid are the characteristic loading devices of cotton pressing and storage buildings: vertical steel tracks reaching from the ground level to the loading gates of the different floors. The architecture, which is straightforward and utilitarian, and features no embellishment, is probably the work of civil engineers of British or German background. The design obviously served its purpose well, since it was replicated down to the details by the Egyptian engineers who built the third building after the company's nationalization in 1956.

In contrast to this bare plainness, the last example presented here can be seen as representing the other extreme of the bandwidth within which Modernist industrial architecture in Egypt operated during this period. It is the factory complex of the Selected Textile Industry Association (STIA), built from 1946 onward in Alexandria's Hadra district (figs. 57-61). STIA was established in 1946 under incorporation of the older Standard Egyptian Textile Industry (SETI), and was headed by the Alexandrian Greek Simon Pialopoulo, directed by Stefano Papachristou, and had a management composed of Greeks, Egyptians, and other nationals. To design the new plant, which was to integrate the spinning, weaving, dyeing, and finishing of cotton, wool, and synthetic textiles, the company hired the architect Ferdinand J. Debbané, an Alexandrian of Syro-Lebanese extraction who had studied civil engineering in Britain. The buildings he designed for STIA are certainly among the most elegant industrial structures visited during the survey. The factory was obviously designed to impress, and was advertised in the 1949 edition of *Egypt Today* with a bird's-eye drawing of the building proudly described as "a most modern textile factory" (fig. 57).

The initial complex (disregarding the later additions for the time being) was composed of two rows of buildings arranged on a roughly triangular plot, with a long straight northern border and an inward-curving southeastern border. The outlines of the buildings generally follow the outlines of the plot to make maximum use of the available area.

The northern block therefore is a long, rectangular, single-story hall subdivided by a four-story administrative building in the center. The southern block is triangular in shape with a beautifully-curved southeastern façade. The wide factory halls are built in concrete-framework construction with a flat-roofed monitor rising above the central aisle, and have regularly-interrupted window ribbons running along all façades. The façades display a high concern for

83 This year of construction was related to me during a visit to the site by an older employee of the company and still needs to be confirmed by other sources.

"stylish" details like rounded corners, profiled window frames, cornices, ventilation openings, and roof drainage. Against the factory buildings' marked horizontality, the administrative building stands out as the only vertical element, with its monumental front and large glazed surfaces between rounded columns—again reminiscent of a portico. The interior of the entrance area is luxuriously decorated with marble and colored-stone inlay as well as other details in an almost neo-Baroque variety of Art Deco.

Later extensions were built in the mid 1950s on remaining sections in the plot's western parts and on land purchased along its eastern side. These were multistory structures, again designed by Ferdinand Debbané, and were in keeping with the original plant's architectural details. The extensions incorporated innovative technical features, however, such as the use of octagonal concrete columns with mushroom capitals for supporting the new wool factory's continuous floor slabs—a solution chosen to accommodate the heavy loads and vibrations of wool-weaving looms in this large six-story building (fig. 61). Another innovation was the use of cylindrical shell roofs, as a large single-barrel shell for the wool factory (here, it was in necessary combination with integrated concrete-trusses) and as multiple-barrel shells (in the proper sense) for the newly-added second floors on top of some of the older single-story buildings (fig. 60). In this, the British-trained Ferdinand Debbané kept up closely with technical developments and fashions in industrial architecture elsewhere in the world, and confirms what has been said about British architects in the period after the Second World War that "no self-respecting architect at this time would be without a shell-roof job."⁸⁴

In contrast, the original 1946 design of the STIA works, similar to Sayyid Karim's Misr Tobacco Factory of 1941, features the same peculiar combination of functionalist factory design with a clear penchant towards monumental Classicism, the symmetrical, and the ornamental. This blend of conspicuous Modernism and conspicuous display of corporate power might be partly due to the clients' needs and taste, but may also express an ongoing internal struggle between Classicism and Modernism that architects in Egypt were experiencing during this period of transition.⁸⁵ Still, when compared to the considerably more varied palette of

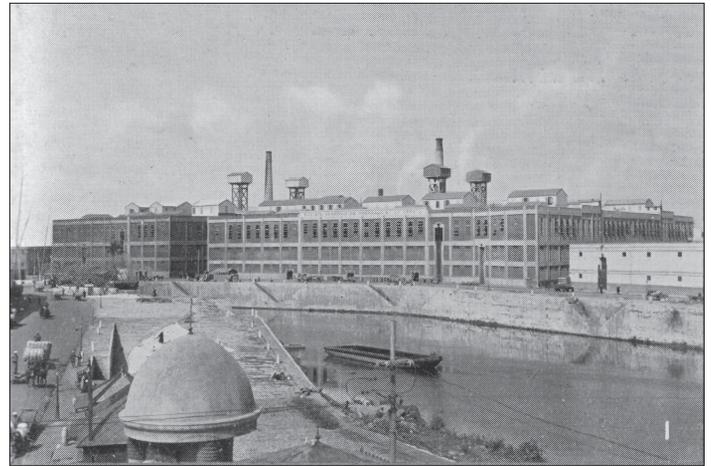


Fig. 55: Alexandria, Minat al-Basal District, Société Général de Pressage et de Dépôts, 1936; photo of the cotton-pressing and storage buildings used for a 1939 advertisement.



Fig. 56: Société Général de Pressage et de Dépôts, detailed view of a cotton-pressing and storage building.

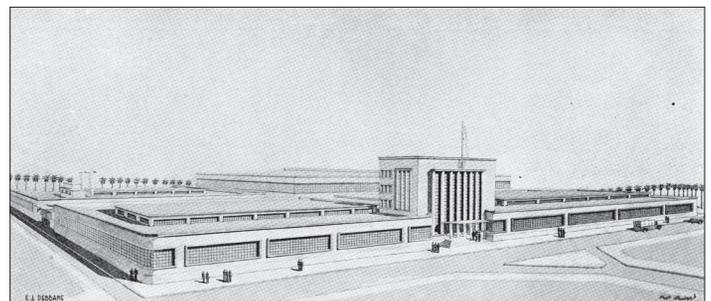


Fig. 57: Alexandria, Hadra District, STIA works, Ferdinand Debbané, 1946; drawing used for a 1949 advertisement.

84 Robert Anchor, "Concrete shell roofs, 1945-65," in Mike Chrimes, Dawn Humm, and James Sutherland (eds.), *Historic Concrete: The Background to Appraisal* (London: Thomas Telford, 2001), p. 177.

85 I owe this idea to a comment made by Aly Gabr (architectural historian and the grandson of 'Ali Labib Gabr) during our conversation on June 26, 2009.



Fig. 58: STIA works, street façade view of the southern blocks.



Fig. 59: STIA works, view of the northern block showing the administration building flanked by factory halls; the second floor of the factory halls was added in the mid-1950s.

styles that Egyptian architects (including those of “local-for-foreigner” background) applied and experimented with in this period for residential or public buildings, their factory designs were certainly among the most thoroughly Modernist in the country.

Industrial architecture after the 1952 revolution

The takeover by the Free Officers in 1952 did not, at first, change the basic assumption that free enterprise based on private property rights was the precondition for economic and industrial development. The new regime initially fo-

cused on agricultural reform and on developing infrastructure and social services, and maintained a liberal policy that encouraged private enterprise and foreign investment. A new policy of increased state intervention in the economy and of capital-intensive industrialization from above only came into effect in the wake of the 1956 Suez War. Still, light industries at this point were meant to be financed by private capital, and only the then underdeveloped heavy industries were subject to state-financed development. However, the sequestration and nationalization of foreign holdings in Egypt began in November 1956, starting with all British and French firms. As private investments in industrial development failed to meet the regime's expectations, the government went on to nationalize other private enterprises, including Egyptian ones. Most important was the nationalization of the powerful Bank Misr in 1960, with its vast holdings in the industrial sector, which considerably increased the state's share in this sector. The construction from 1960 to 1964 of the Aswan High Dam for electricity generation, and the increased exploitation of natural resources like oil and gas in the Red Sea, the Delta, and the Mediterranean aimed at supplying energy for the regime's ambitious program of rapid industrialization.

The success was palpable. While in 1952 the industrial sector accounted for only 10% of Egypt's Gross National Product, it had surpassed 20% in 1962. Numerous large factories were built in industrial areas around Cairo like Helwan, Madinat Nasr, Shubra al-Khayma, and Imbaba, as well as elsewhere in Egypt. From 1960 onward, the yearly growth of the industrial workforce was at 2%. And while in 1957, 90% of Egypt's industrial workforce worked in small workshops with a headcount of four or fewer persons, factories with more than 500 workers had become more common by 1970. As we will see from the examples presented below, this growth was also due to the expansion of existing factories after their nationalization. The massive reduction of private enterprise and its replacement by a command economy in the 1960s, however, also had decisive negative effects on Egyptian industry. This is evident in the lack of competition, a cumbersome bureaucracy, surplus labor, over-staffing, and reduced productivity. The disastrous Arab-Israeli war of 1967 and the resulting financial exhaustion of the state led to a slump in production and even the temporary idleness of large factories.

Industrial development only began to pick up again after Anwar el-Sadat's accession to power in 1970, and—more im-

portantly—with his new Open-Door Policy (*Infatih*) since 1971, which allowed for establishing a free-market economy with the aims of instigating private-sector development, attracting foreign capital, and revitalizing the public sector through competition. The earlier program of massive state-sponsored industrialization was given up in favor of a more balanced policy of agricultural and industrial development.⁸⁶ Still, the state's investment in public-sector industry did not come to a halt, as illustrated by the new STIA factory that will be presented below. The state's continued involvement in industrial development is also manifested in the planning and construction of new, centrally-planned cities in the deserts outside Cairo, like the 10th of Ramadan City, the 6th of October City, and Madinat al-Sadat, which began in the late 1970s. They were to include large industrial areas and indeed quickly attracted significant investment and new factories from the growing private sector.⁸⁷ The development of these industrial areas is still under progress and is beyond the scope of this article.

The two examples of industrial buildings of the post-nationalization period presented here are located in Alexandria. They are the extensions of al-Shirka al-Ahliyya (the former Filature Nationale), built in 1962, and the new plant of STIA, built between 1971 and 1974.⁸⁸ They are beautiful and artful examples of two different building types—the single-floor hall and the multistory block—and evince the continuation and maturing of Modernism in Egypt's industrial architecture during this period. As works by Egyptian architects and engineers, they also illustrate the degree to which Modernism had been appropriated as a local architectural language of impressive vitality and variety.

The extensions of al-Shirka al-Ahliyya were begun in 1962, immediately following the company's nationalization,

86 On the subject of economic development during the Nasser and Sadat periods, see Vatikiotis, *The History of Modern Egypt*, pp. 393–402 & 427–436; Scharabi, *Industrie und Industriebau*, pp. 39–40 & 49–52; Ezzat Molouk Kenawy, "The Economic Development in Egypt During the 1952–2007 Period," *Australian Journal of Basic and Applied Sciences*, 3:2 (2009), pp. 588–603; and Robert Mabro, *The Egyptian Economy, 1952–1972* (Oxford: Oxford University Press, 1972).

87 See, Günter Meyer, "Wirtschaftsgeographische Probleme der Industrieansiedlung in den neuen Entlastungsstädten der ägyptischen Metropole" [Economic-geographic Problems of Setting up Industries in the New Overspill Towns of the Egyptian Metropolis] *Erdkunde* 42 (1988), pp. 284–294.

88 It proved extremely difficult to obtain access and photo permissions for factories of this period, let alone to obtain information on them. For many factories that are scheduled to be visited, permissions are still pending. Fortunately, the management and employees of al-Shirka al-Ahliyya and STIA were very welcoming and supportive—for which I would like to express my heartfelt gratitude.



Fig. 60: STIA works, view showing the multistory wool-factory building to the right, and the administration building and shell roofs of the second-floor factory-hall additions to the left.



Fig. 61: STIA works, wool factory, Ferdinand Debbané, mid-1950s; interior view showing mushroom columns.

on purchased land to the east of the existing plant, which more than doubled the size of its plot (from about 15 to 33 *feddans* (a *feddan* equals 4,200 square meters)) (figs. 62–68). The new buildings comprised a dyeing mill for cloth and a dyeing mill for yarn, with an overall surface area of 20,000 square meters, in addition to repair workshops and a generator building. They were meant to expand production capacities in line with the firm's original integrated spinning, weaving, and dyeing activities. According to a long-time employee of the company, these buildings were built by an Egyptian engineering firm named "SPICO."⁸⁹ Taken together, these few buildings present considerable architectural variety and give us a fairly good idea of what other single-story

89 SPICO had merged with another company to become the public-sector company presently known as the Nile General Company for Reinforced Concrete.

Fig. 62: Alexandria, Muharrem Bey District, al-Shirka al-Ahliyya (Filature Nationale), extensions, SPICO engineering company, 1962; new dye works for yarn, with openings in the shape of Diocletian windows.



factory halls of this period looked like. The dyeing mill for cloth is a vast and lofty single-story hall with thirteen barrel roof units in cantilevered shell construction with shell-roofed monitors, built in reinforced concrete with exterior red brick infill walls. The dyeing mill for yarn is a smaller building of an externally very similar design. Yet it features a low ground floor for mechanical installations serving the upper-floor workshop hall. Also, the six units of barrel-vaulted roofs with monitors on the upper-floor are supported by concrete trusses. In addition, the barrel vaults feature large glazed openings in the shape of Diocletian windows at both ends—a beautiful detail that triggers associations not only with Roman *thermae*, but also with early-Modernist buildings like Otto Wagner's early-20th-century Post Office Saving Bank in Vienna.

With their magnificent roof structures, the two dyeing mills are unique when compared to other factory halls of the period identified during the survey. But other parts of al-Ahliyya's 1960s extensions also feature roofing solutions that were much more common during the period. An example is the north-light saw-tooth roof construction in reinforced concrete used for an extension of the cloth-dyeing hall (fig. 67). Similar north-light roofs—either with inclined flat slabs or with cylindrical shells—have been observed at many other factories. Yet another roofing system, also observed at other factories, is the beautiful, softly-undulating multi-barrel shell-roof without monitors used for al-Ahliyya's new generator building (fig. 68). In combination with the windows' stacked *brise soleil* elements, which resemble cooling fins (and in a way are very fitting for a generator building), this building epitomizes the factory as machine.

While the al-Ahliyya extensions consisted by and large of single-story halls, the last example presented here is the multistory textile mill erected by STIA between 1971 and 1974 (figs. 69–70). STIA, whose 1946 plant and 1950s extensions have already been discussed above, was renamed el-Nasr Wool & Selected Textiles Company after nationalization, but kept its original acronym as an established brand name. With no further space left available within the confines of the old works, this exceptionally-successful public-sector company built a new wool factory on a vacant plot located a few hundred meters to the northeast of the old plant. The new plant was to comprise a multistory main block with an attached administration building as well as single-story wool dyeing works, repair workshops, storage halls, and wa-



Fig. 63: al-Shirka al-Ahliyya, view of 1962 extensions, with new dye works for cloth (right) and for yarn (left).



Fig. 64: al-Shirka al-Ahliyya, new dye works for cloth.



Fig. 65: al-Shirka al-Ahliyya, new dye works for cloth, interior view showing cantilevered shell roof.



Fig. 66: al-Shirka al-Ahliyya, new dye works for yarn, interior view.



Fig. 67: al-Shirka al-Ahliyya, new dye works for cloth, 1960s extension with north-light saw-tooth roof.



Fig. 68: al-Shirka al-Ahliyya, 1962 extensions; view of generator building with undulating multi-barrel shell roof.

ter and power-supply installations.⁹⁰ Among these, the main block is certainly the most interesting and was already considered innovative at its time. Designed by the Alexandrian architecture firm Abu al-Fadl, Hadari and Khuli, the building is composed of a cubic central block of five stories in externally-visible concrete-framework construction that is symmetrically flanked by two receding annexes with trapezoidal plans and red-brick cladding.⁹¹ With their ribbon windows and eye-catching concave end-walls, these annexes clearly stand in the tradition of earlier Modernist structures of the 1930s and 1940s. Remarkably, the annexes have nine floors, but are of the same height as the five-story central block. The reasons behind this are functional and structural: functional, because the annexes house the staircases, freight elevators, office rooms, changing rooms, sanitary rooms, and other ser-

vice facilities, while the central block contains solely the large workshop halls, each of which takes up a whole floor; and structural, because the factory halls have a greater clearance height and because of the peculiar floor construction used in this part of the building. In order to limit the number of columns inside the halls and still provide enough load-bearing capacity for the heavy jennies, looms, "Sulzer" diesel generators, and other machinery, all the floors were built following an innovative double-floor or sandwich system, for which two superimposed concrete slabs with integrated girder-and-beam grids are vertically connected by densely-spaced concrete posts. The interior clearance between the interconnected floor slabs is about 1.5 meters, and thus constitutes a kind of hidden mezzanine floor used for piping and installations.

Beyond being an example of innovative engineering, the STIA building also represents the continuity of "monumental" architecture in the industrial context. The building is located on a triangular plot on the northwestern side of a public roundabout, Midan Sirri Pasha. Its trapezoidal annexes re-

90 To these, a sport club for workers and employees was added on an adjacent plot. Such social infrastructure apparently became more frequent with public-sector companies in the 1970s, and would offer yet another interesting subject for further research.

91 Original plans of the building—with the architect's signature—are kept in the archives of STIA and were kindly made accessible to us.

spond to the radial roads, while the three-story administrative building in front of the central block is curved, following the shape of the roundabout. Its curving shape could be a reference to the work of Oscar Niemeyer, who due to his developing-world and communist background would have been a fitting role-model for Egyptian architects of the 1960s and 1970s.⁹² Finally, in its siting and grand architectural gesture, the Alexandrian STIA wool factory building has a peculiar affinity to the Mugamma' building, the enormous central administrative complex on Midan al-Tahrir in central Cairo.⁹³ The overall effect is truly impressive even today, and we may assume that the erection of such a building by a public-sector company in the early 1970s instilled a sense of pride among passersby on this major urban traffic junction. State-owned factories were still skillfully designed and built under Sadat's *Infitah* policy to serve as symbols of progress and development, and as monuments of power—of the state, rather than of corporate capital.

Concluding remarks

As this overview has shown, Egypt's industrial architecture developed from the beginning as a material manifestation of international connectedness, in close interaction with local and global forces and resources, integrating know-how, manpower, and material from very diverse origins: Italian, French, Maltese, Turkish, and Egyptian technicians, Egyptian masons, Rumi carpenters, firebricks from Scotland, wood from Bilad al-Rum, stone and brick of local origin, and machinery from England. Egypt's earliest modern factories already drew from and catered to an increasingly globalizing market, and throughout the 19th and 20th centuries, this connectedness intensified. The main initiators and patrons of industrial establishments changed repeatedly, from a ruler's monopolist initiative under Muhammad 'Ali, to private enterprise and international corporate capital from the mid-19th to the mid-20th century, to state-socialist patronage under Nasser, and back again to a larger role for private and corporate capital with Sadat's *Infitah*.

Independent of this chronology of ownership, the country's industrial architecture increasingly followed global trends in building technology and architectural fashions. Mu-

92 Oscar Niemeyer's work was certainly known to Egyptian architects—not least because he planned and built the International Fair of Tripoli in Lebanon (1963–1975).

93 The Mugamma' was built from 1950 to 1954, at the end of King Faruq's rule, but has come to symbolize the republican era as it was completed soon after the 1952 revolution.



Fig. 69: Alexandria, Hadra District, STIA, new wool factory, Abu al-Fadl, Hadari, and Khuli 1974; view of the southern facades of the administration building and the central factory block facing Midan Sirri Pasha.



Fig. 70: STIA, new wool factory, view of the trapezoidal annex and central factory block from the west.

hammad 'Ali's factories were idiosyncratic structures, often of large dimensions, that made extensive use of established techniques while reflecting the ruling elite's predilection for the supra-regional Ottoman Rumi-style. Buildings from the later 19th century tended to be privately owned, were smaller, and evinced the growing influence of European building types (especially the gable-roofed factory hall with monitor). They reflected the shift of taste towards European historicist styles, but were still mostly built in traditional materials like brick and timber. Starting in the last two decades of the 19th century, revolutionary developments took place on several levels. Against the background of British colonization, increased land capitalization, and a concomitant building boom, the con-

struction business expanded vastly. Iron, steel, and soon even concrete construction experienced rapid proliferation; architects and contracting firms were hired by a new type of local and foreign capitalist to build factories that were technically up-to-date with those in main industrial countries, and stylistically in line with what Scharabi aptly termed the "international style" of historicist architecture.⁹⁴ It is also important to note that this was the beginning of a "corporate monumental architecture" in Egypt, which became widely accepted for industrial buildings, and was to continue as such even after these industrial establishments were nationalized and turned into public-sector companies.

The most intriguing development of the second quarter of the 20th century was probably the triumph of Modernist architecture. This triumph was more complete and enduring in industrial architecture than it was in other areas of Egypt's architectural production. This is intriguing because it was to a very large degree due to the local—and partly nationalist—agency of internationally-trained Egyptian architects and their Egyptian capitalist clients, who turned away from historicism and appropriated Modernism for their factory projects. Can Modernist industrial architecture in Egypt, therefore, be considered an expression of anti-colonial nationalism? Or was it a dream of social order through "Western" techniques? These questions may have to remain unanswered for now, but it is certain that under the anti-colonial, nation-

alist, and socialist government of Nasser, high Modernism continued to serve as the quasi-official signature style for industrial buildings—now almost exclusively designed by Egyptian architects and engineers. Modernism accordingly had been made a national style, at least as far as industrial architecture is concerned.

Mohamed Scharabi ended his book on industry with a rather negative judgment of the industrial buildings constructed in Egypt since 1945, stating that they "are hardly different from those in Europe and North America," and that they "appear, like everywhere in the world, anonymous and hardly distinguishable."⁹⁵ This may not be completely wrong, at least from an initial reading of them, but then, it is equally true of many of the buildings constructed in Egypt since the end of the 19th century. However, since modern industrial architecture is an international phenomenon that is intrinsically tied to global networks of exchange, this should not be considered a liability, but a specific characteristic of industrial architecture. At closer examination, it should be noted that when visiting these factories, one cannot but develop an appreciation of their architectural quality, which reflects a continued engagement with architectural developments taking place elsewhere in the world as well as artful adaptations and solutions resulting from specific local circumstances, conditions, and needs. As such, these industrial buildings are material evidence of the intrinsic intersections of global and local history, and offer a vast, but still widely-neglected potential for historical research.

94 Mohamed Scharabi, "Der Historismus, ein Internationaler Stil. Das Beispiel Kairo," [Historicism, an International Style. The Example of Cairo] *Istanbuler Mitteilungen* 39 (1989), pp. 483–491.

95 Scharabi, *Industrie und Industriebau*, p. 51.