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QAL'AT AL-ṬĪNA IN SINAI

An Historical-architectural Analysis

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INTRODUCTION

At the time (1859) * that the French Académie des Inscriptions et Belles-Lettres prepared a master plan for an historical and archaeological study of Egypt's antiquities [1], the role of the Muslim period in it was – as it would be, to some extent, later on – quite secondary [2]. For despite the important contribution by French scholars, in ensuing years, to the scientific establishment and determination of the archaeology of Muslim Egypt, it is a characteristic fact, that even though the Academy did include al-Ṭīna in its program [3], Qal'at al-Ṭīna was never investigated until the present. This would have hardly bothered the « Muslim » archaeologist, in view of the enormous volume of Muslim material as yet uninvestigated, within whose scope Qal'at al-Ṭīna would have been regarded, in all likelihood, as a minor monument, ostensibly marginal in its location and of little significance. Indeed, this standpoint is evident even in the massive and comprehensive work of Jean Clédat; despite his indication of the peculiar features of the structure, he consciously omitted it in his work, dismissing it with a brief remark about its topography [4]. Clédat's interest (perhaps also his scholarly background, multi-faceted and impressive though it was) and that of other researchers before and after him, lay more in the ancient and classical heritage, so that Pelusium, rather than al-Ṭīna [5], became the projected focus (partly executed, however) of these studies. The herein attempt to shed light on the historical significance of Qal'at al-Ṭīna and to study its archaeological importance may therefore contri-

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[1] Instructions Données par l'Académie des Inscriptions et Belles-Lettres a Auguste Mariette sur les Principales Recherches a Exécuter en Egypte dans l'Intéret de l'Histoire et de l'Archéologie; ASAE II, 1901, 112 ff.

[2] This general statement is based, inter alia, on the bibliography which Henri Gautier published in ESRGE, from volume XI and further.

[3] *Ibid.*, 117.

[4] J. Clédat, *Le Temple de Zeus Cassios à Péluse*, ASAE III, 1914, 79.

[5] A summary (up to 1937) of the historical, geographical and archaeological studies (in addition to the ancient literature) was made by H. Kees, in *Paulys Realencyclopädie der Classischen Altertumwissenschaft*, XIX 1, 1937, 407–415. A more up to date survey is furnished by A. L. Fontaine, *Enquête sur Péluse* (henceforth « Enquête »), BSEHGIS IV, 1951–1952, 17–81.

bute not only to the subject of the Mamlūk coastal strategy, but also, in peculiar fashion, to the history of military architecture of the Later Middle Ages.

THE LOCATION OF AL-ṬĪNA

The fixing of al-Ṭīna's location is linked with its name: (a) in view of the affinity of the name of al-Ṭīna – « al-Ṭīn » [6] to πηλούσιον > πηλός, this being but the translation of the Egyptian *sàn* also found in its variation *ṣin* [7], identical with « Ṭīn » or « Ṣin » in Hebrew, the Hebrew Ṣin becoming transformed into the Syriac « Ṭīn » which leads on to the Arabic « Ṭīna », Clédat sought to conclude that this was but a *nom donné présentement aux ruines de l'ancienne ville arabe* [8]. But in his more scrupulous attempt to identify its location, he stated earlier (in 1914) [9] that (1) *Tineh représentant très vraisemblablement l'emplacement de l'ancienne ville arabe*; (2) its fort is located about three kilometers northwest of Pelusium [10].

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[6] See Yāqūt, *Mu'djam* IV, 56. The etymology of Ṭīna–Pelusion has already been dealt with by Th. Shaw (although he confuses Ṭīna with Tinnīs; below), *Travels*, Oxford 1738, 36, n. 1, 336.

[7] W. Spiegelberg, Der Ägyptische Name von Pelusium, *Zeitschrift für Ägyptische Sprache und Altertumskunde*, XLIX, 1911, 81–(84).

[8] J. Clédat, *Notes sur l'Isthme de Suez*, BIFAO, XXII, 1923, 167–168. The Atlas of Ancient Egypt, EEF, London 1894, 19. While the question of the nature of « the ancient Arab city » calls for precise historical and topographical clarification (see also note 13), according to Mubārak, on the other hand (Khiṭaṭ XIII, 67), « Ṭīna » was but the name for Pelusium in the Arabic sources, so that also in DE, XVIII, 175, the ruins of Pelusium are marked as *Tyneh*; see also DE II², État Moderne, 74–75 (1882): *Mémoire sur la Construction de la Carte d'Égypte*, file. 34 (13–I). In view of the association of Ṭīna with Pelusium, indicated apparently in that, as of its capture by the Arabs in 639, Pelusium was also called « Ṭīna », Qatremere (*Mémoires Géographiques et Historiques sur l'Égypte*, Paris 1811, I, 63–71) sough to identify *Baḥr Abī* (*Banī*) *Munadjā*, noted by al-Ẓāhirī (Zubda, 34) as a Nile canal, outflowing near Ṭīna, with the Pelusiac branch of the Nile. Without going here into the details of the canal, dug by the Jew Abū al-Munadjā at the command of al-Afḍal b. Amīr al-Djuyūsh in 506/1112 (see Maspero–Wiet, *Matériaux*, 33–34 + map), it seems that the Pelusiac branch may be delineated today with more or less certainty; see A. Sneh–T. Weissbrod, Nile Delta: The Defunct Pelusiac Branch Identified, *Science* 180, 59–61.

[9] J. Clédat, *Le Temple de Zeus Cassios à Péluse*, ibid., 79.

[10] As a toponym, the name « Ṭīna » appears to be rare. Mas'ūdī (*Murūdj al-Dhahab*, Paris 1861, I, 215), named Qal'at Sumaysāt (= the Roman Samosata on the northern bank of the Euphrates) « Qal'at al-Ṭīn »; this, however, should be regarded as a euphemism reflecting the strength of the fort. This explanation is based on the « unassuming » name given by Yaḥyā b. Barmak to his splendid palace in Shamāsiyya in Baghdād: *Qaṣr al-Ṭīn* (see al-Iṣfahānī, *Kitāb al-Aghānī*, Būlāq, V, 8). On the other hand, the fact that « Ḥiṣn Ṭayba », captured in 727/1009 by Mu'āwiya b. Hishām during his incursion into « Arḍ al-Rūm », is also noted as « Ṭīna » in the Oxford manuscript (C.B.M. 394) of Ṭabarī

(b) In its Arabic version, Pelusium was named, apparently already in the 7th Century [11], al-Faramā['], this being the Coptic BAPAMIA (= Baramā), transformed into BAPAMOYN (= al-Faramā, or, to be exact, ΠΕΡΕΜΟΥΝ, itself derived from an Egyptian word [12].

Yāqūt [13], in seeking to fix al-Ṭīna's location, defined it as a « bulay-

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(*Ta'rīkh al-Rusul wal-Mulūk*, II/9, 1495: g) does not necessarily indicate that naming it « Ṭīna » was correct. On the contrary, it appears that here, as in the quotation by Ibn Taghrībirdī (*Nudjūm*, Cairo I, 266–267), it should be read as « Ṭayna », which may be identified (according to E. W. Brooks, *The Arabs in Asia Minor, from Arabic Sources, Journal of Hellenic Studies*, XVIII, 1898, 199, n. 3) with τὸ κάστρον Ἀτεοῦσ mentioned by Theophanes (*Chronographia* A. M. 6219, ed. C. de Boor, Hildesheim 1963, I, 407. In this context it is worth noting that in the report by Ibn al-Furāt (*Ta'rīkh al-Duwal wal-Mulūk*, ed. N. & M. C. Lyons-J. S. C. Riley-Smith, *Ayyubids, Mamluks and Crusaders*, Cambridge 1971, I, 126) about Baybars' assault on Sis in Little Armenia in 664/1265, he reports the destruction of the Templar fortress, known as al-Tīna (or al-Tīnāt; this version already appears in Iṣṭakhrī, *Masālik al-Mamālik*, BGA, I, Leiden 1967, 63; according to Ibn 'Abd al-Ẓāhir, *al-Rawḍ al-Zāhir fi Sīrat al-Malik al-Ẓāhir*, MS Arabe, Fātiḥ (Istanbūl) ar. 4367, fol. 90 B: « al-Tiniyāt ». This version may have something to do with *al-Batnīyāt* in Iṣṭakhrī's Gotha MS, ibid., d/63. According to Lyons-Smith (*ibid.*, II, 99) this was but Canamella, for which see RHC, *Documents Arméniens*, Paris 1849, I, xxx, 813. On the other hand, Pīrī's « Tīna » (*Baḥriye*, 722–723) relates to Ṭīna in Sinai. Here mention should be made of « Tūna », the island lying between Tinnīs and Dimyāṭ (see Mas'ūdī, *Murūdj*, I, 212; Yāqūt, *Mu'djam* II, Beirut 1956, 62–63).

11 During the conquest by 'Amr b. al-'Āṣ, probably late in 639); for this date see Wiet, *Précis*, II/II2 145; with regard to the complicated chronology of the conquest of Egypt, see A. J. Butler, *The Arab Conquest of Egypt*, Oxford 1902, 526 ff., which dates the capture of Faramā as on January 20, 640 (*ibid.*, 544). See also Maspero-Wiet, *Matériaux*, 138. This, at any rate, was the source of the designation of al-Faramā by the scholars in the Napoleonic expedition as an « Arab city »; see, for example, Gratien le Père, Extrait du Journal Historique, etc. DE XI, 1820, 335.

12 Clédat, *Notes sur l'Isthme de Suez, ibid.*, 168–170. Regarding the etymology of Faramā, which, according to Maqrīzī, was one of the Five Djifār cities (regarding which see Maspero-Wiet, *Matériaux*, 70), see Maqrīzī *Khiṭaṭ* (Lebanese edition), I, 372, 332.

13 Yāqūt, *Mu'djam* IV, 56: are we to infer herefrom that, some time between 639 and 1150, this « settlement » extended farther in a northwesterly direction? Regarding this question, see also Fontaine, *Enquête*, 39. In this context it is interesting to note the report – albeit ambiguous – of Maqqarī (*Nafḥ al-Ṭīb*, ed. Dozy et alii, Leiden 1855–6/Amsterdam 1967, 583–584), regarding the journey, from Syria to Egypt, of the Ṣūfī Andalusian poet 'Alī b· 'Abdallāh al-Numayrī Abū Ḥasan al-Shushtarī (1209–1269): on the one hand, his stopover – because of his fatal illness – at al-Ṭīna, there described as « *qarya bi-sāḥil al-baḥr al-Rūmī* »; on the other hand, his request that he be buried in Dimyāṭ, because Ṭīna was « *bi-mafāza* ». Cf. also al-Nabahānī, *Djāmi' Karamāt al-Awlīā'*, Beirut, ed. II, 178; with regard to Ṭīna's description as a *village d'Egypte*, see also O. Toussoun, *La Géographie de l'Egypte*, Cairo, 1926,183. Despite the uncertainty regarding al-Shushtarī's exact burial place (at Dimyāṭ or at Qarāfa/Cairo; the latter version is cited by 'Abd al-Ghanī al-Nābulusī, *al-Ḥaqīqa wal-Madjāz*, MS Vienna 712, Cod. Vind. II, fol. 216 B, quoting al-Munāwī; al-Nābulusī's erroneous version – that the tomb is located in the Christian

dah » between al-Faramā, which was still standing at mid-12th Century [14], and Tinnīs « fī Arḍ Miṣr ». But since al-Faramā is no longer in existence al-Ṭīna's location is set in its affinity to Qaṭya [15] or to Dimyāṭ [16]; this is how Maqrīzī and Ibn Taghrībirdī have it: *Al-Ṭīna qarībā min Qaṭyā wa-min Dimyāṭ* [17]. Ibn Ḥadjar al-'Asqalānī's version [18] is *al-Ṭīna muqābil*

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quarter in Cairo, stems from his having confused al-Shushtarī with al-Tustarī: see Ibrāhīm Qāsem, *The Ziyārāt of al-Nābulusī in Egypt and the Ḥidjāz* (Heb.) M. A. thesis, MS Bar-Ilan University, 1977 n. 354), it is evident that, following his death in Ṭīna, he was buried elsewhere. When Ṭīna was at one time *bulayda* or *qarya*, the Ṭīna region was, at any rate after 1269, but a desert, a fact which serves as a basis for Muḥammad Ramzī's negation of Ṭīna as a *bulayda* and as a border outpost; see *al-Qāmūs al-Djughrāfī Lil-bilād al-Miṣriyya*, Cairo 1953, I, 86.

[14] Even though in the *Marāṣid* al-Faramā is designated as *madīna qadīma bayn Al-'Arīsh wal-Fusṭāṭ kharāb qad safat al-raml 'alayhā Qurb Qaṭya sharqī Tinnīs 'alā sāḥil al-baḥr* etc. [see al-Baghdādī, *Marāṣid*, 1955, III, 1031] it is evident that after it was burned down in 1115/8 by Baldwin I, it still remained extant until at least 1150–1165 (see Ibn Mamūn al-Baṭā'ihī, quoted by Maqrīzī, *Khiṭaṭ* I, 373–374; Ibn Duqmāq, *Intiṣār*, V, 53; also J. Clédat, *Raid du Roi Boudouin Ier en Égypte*, BIFAO XXVI, 1925, 71–73; G. Wiet, *L'Égypte Arabe*, 544). From Abū al-Fidā's report, (Renault ed., Paris 1848, II/I, 146), at any rate, it appears that al-Faramā was already in ruins in the 14th century.

[15] We still lack an historical synthesis of this important commercial center (customs' station, market, industry) and administrative post (postal station: for some of the Arabic sources see, in the meantime: Yāqūt, *Mu'djam*, IV, 378, Baghdādī, *Marāṣid*, III, 1111; Ibn Baṭūṭa, *Riḥla* (Cairo 1931, I, 43; Ibn Duqmāq, *Intiṣār*, V, 52–53; Maqrīzī, *al-Bayyān wal-I'rāb 'ammā* bi-Arḍ Miṣr min al-A'rāb (Cairo, 1961), 61; Qalqashandī, *Subḥ al-A'shā* (Cairo 1919), XIV, 377–378, Index s.v.; al-Ẓāhirī, *Zubda*, 35; Ṣayrafī, *Inbā'*, 289, 419 and *Nuzhat al-Nufūs wal-Abdān fī Tawārikh Ahl al-Zamān* (Cairo 1970), 107; Suyūṭī, *Ḥusn*, II, 86; Nābulusī, *Al-Ḥaqīqa wal-Madjāz fī Riḥlat Bilād al-Shām wa-Miṣr wal-Ḥidjāz*, Paris, B. N. MS 5043, fol. 152 A; 'Alī Mubārak, *Khiṭaṭ*, XIV, 103; Na'ūm Shuqair, *Ta'rīkh Sīnā'* (Cairo 1916) 174–175; 'Abbās Muṣṭafā 'Ammār, *al-Madkhal al-Sharqī li-Miṣr*, BSRGE XXI, 1943–1946, 181–182, 178; R. Hartmann, *Katja und el-Dschifar in der Geographischen Literatur der Araber*; Mitteilungen... *Globus* 62, 1916, 373–377; O. Toussoun, *La Géographie de l'Égypte*, 124; G. Wiet, *Les Communications en Égypt au Moyen Age*, *L'Égypte Contemporaine*, XXIV, 1973, 257–258; W. Popper, *Egypt and Syria Under the Circissian Sultans*, XV, 1955, 47; A. R. Guest, *Itinerary from Kantara to Arish*, *Geographical Journal* XIII, 1899, 282 (= Signalling-Tower).

[16] For Dimyāṭ see Maspero-Wiet, *Matériaux*, 92–93. For Ṭīna's location between Dimyāṭ and Qaṭya, see Qalqashandī, *Subḥ al-A'shā*, XIV, 64.

[17] Maqrīzī, *Al-Sulūk fī Ma'rifat Duwal al Mulūk*, MS B. N., Paris 1727, fol. 368 A; Ibn Taghrībirdī, *Nudjūm* (Cairo 1972) XIV, 280. Cf. also Ibn-Wāṣil *Mufarradj al-Kurūb bi-Akhbār Banī Ayyūb*, Paris, Ms B. N. 1702, fol. 353 A. The function of this triple arrangement is explained by Ṣayrafī (*Nuzhat al-Nufūs*, 398) in that Ṭīna served as a connecting link between Dimyāṭ and Qaṭya; cf. also Maqrīzī (*Sulūk*, Cairo 1970, III, 2 825) who reports similarly.

[18] Ibn Ḥadjar al-'Asqalānī, *Inbā' al-Ghumr fī Abnā' al-'Umr* (Cairo 1969), III, 346.

Dimyāṭ, or, as al-'Aynī has it [19]: *Ṭīna allatī biqurb Qaṭya* (hence also « Ṭīna Qāyṭa »). Ṭīna's affinity to Qaṭya is explained by Khalīl b. Shāhīn al-Ẓāhirī [20]; he views the first as the port of the second: *wa-lahā mīnā' wa-hiya 'alā shaṭṭ al-baḥr al-muḥīṭ* [21]. This last indication of the Medi-

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[19] Al-'Aynī, *'Iqd al-Djumān fī Ta'rīkh Ahl al-Zamān*, Paris, MS. B. N. 1544, fol 170 A, 173 A. Also in this report by al-'Ayni, referring to Barsbāy's second and third expeditions against Cyprus (see further), the affinity between Ṭīna and Dimyāṭ is apparent: on August 25, 1425, the returning force arrived in Ṭīna, having been unable to lower anchor at Dimyāṭ (on August 20). It then tarried there to the 9th- or 13th - of September: M. M. Ziada-J. L. La Monte, *Beder Ed-Din Al-Aini's Account of the Conquest of Cyprus 1424-1426*, Annuaire de l'Institut de Philologie et d'Histoire Orientales et Slaves, VII, 1939-1944, 250 + n. 22, 251 + n. 25, 261, 262.

[20] *Zubda*, 34.

[21] Regarding this apparently surprising designation of Ṭīna's location on the shore of the « Circumferential Sea », see n. 239. The problem of the location of this port is important not only in itself but also for the very identification of « Ṭīna on the coast ». However, in our present state of information, its answer is in doubt, for two reasons: firstly, in the course of my surveys of the area, between Pelusium and the present coastline, there isn't a single sign to attest to its existence; socendly, even the location of Pelusium's port itself is not certain (although see the notation of the port in the French maps of the 19th Century (Fontaine, *Monographie Cartographique*, 100 ff.). For, despite the tendency of Sneh-Weissbrod (*ibid.*, 61 + fig. 2) to identify, in the north-central section of Tell Faramā, a jetty-like structure, located - in their opinion - near the estuary of the Pelusiac branch, it has not yet been proven that the port was actually located there. Nevertheless, if there be support for their argument, based on Carbon Test 14, that the ridge of the ancient shore (the innermost, on their map = fig. 2) dates back to the Roman period, and that the process of the decline of the Pelusiac branch did indeed reach its peak about 25 A.D. (?!), then it would be clear that the port of Ṭīna could not have been south of its present location but rather north of it. This is to say that its present location, on the forwardmost ridge of the shore in the process of the sea's withdrawal northward, would have to locate its port somewhere to its north (perhaps on the shore ridge, between the two ridges which underwent the Carbon 14 test. At any rate, the conclusion to be derived herefrom is that the port of Ṭīna is not identical with the port of Pelusium. While such a conclusion is not impossible, in principle, in view of the constant shifting of the shore ridges line, it is yet to be proven. We may therefore return to Butler's old argument (*ibid.*, 210) namely that Pelusium's port was about 2,500 meters away from the city, with a water canal connecting the two. Should this argument attain confirmation, then it would be possible to accept his conclusion (*ibid.*, 352) that Pelusium's port continued serving as Ṭīna's port, as well (perhaps somewhere between the present shoreline and the coastal ridge, dated in 1605 by Sneh-Weissbrod). One way or another, it is evident that Ṭīna's « port » was (or continued) to be in service, at least as of the first half of the 11th Century (cf. Nāṣir-iKhusrū, *Safar Nāme*, Paris 1881/1970, 109) throughout the late Middle Ages (for the second half of the 15th Century, cf. Ibn Taghrībirdī, Al-Manhal al-Ṣāfī, Jerusalem MS, II, fol. 127 A; V. fol. 260 B; Ṣayrafī, *Inbā'*, 487) and up to modern times (at least to 1799; see below. In this connection, it may be Perhaps of relevance to mention the dispute regarding Ibn Khurdādhbe's designation (Al-Masālik wal-Mamālik, *BGA* VI, Leiden 1889, 153) of al-Faramā as a main transit point from the Mediterranean to Qulzum-Suez on the travel route of the Rādhānite merchants. - that is, while Cahen (*REJ*

terranean coast characterizes the later definitions by Ibn Taghrībirdī and Ibn Iyās: *Al-Ṭīna 'alā baḥr al-milḥ* [22] or *al-Ṭīna 'alā saḥil al-baḥr al-māliḥ* [23]. While al-Djabartī reported, apparently not without reason, about *djazīrat al-Ṭīna* [24], or also *Ṭīna bi-Dimyāṭ* [25], 'Alī Mubārak was able to conclude that *madīnat al-Ṭīna al-Qadīmah kānat maudjūdah biqurb al-mauḍi' alladhī buniyat bihi fī 'aṣrina hādhā madīnat bōrt Sa'īd 'alā [sāḥil] al-baḥr al-Rūmī... fī ṭarīq al-shām* [26]. Indeed, its evident location on the northern border of the Egyptian coast had already been set by Djalāl al-Dīn al-Suyūṭī [27], quoting Ibn Ḥauqal [28], as follows: *I'lam anna ḥadd Diyār Miṣr al-shimālī Baḥr al-Rūm min rafaḥ Al-'Arīsh mumtaddā 'alā al-Djifār ilā al-Faramā ilā al-Ṭīna ila Dimyāṭ ilā Sāḥil Rashīd ilā al-Iskandariyya wa-Barqah 'alā al-Sāḥil.* In the Mamlūk provincial system of

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123, 1964, 499 ff.) questions the definition of al-Faramā as a Muslim port, Ashtor (*Journal of the Economic and Social History of the Orient* XVII, 1970, 183) and Jacobi (*Der Islam* XLVII, 1971, 256) are inclined to accept it. Concerning al-Faramā as a port city see, at any rate, Qudāma b. Dj'afar, *Kitāb al Kharādj* (*BGA* VI, Leiden 1889, 255) and Mas'ūdī (Tanbīh *BGA* VIII, Leiden 1894) 20. An important description of the configuration itself (in 1517?) is found in the unique portolano of Pīrī, *Baḥriye*, 722–723) for this see Svat Soucek, A propos du Livre d'Instructions Nautiques de Pīrī Re'īs Revue des *Etudes Islamiques*, XLI/2, 1973, 241–255): while its external northern disposition apparently followed the straight line of the shore, its internal southern disposition was designed – according to Pīrī's map (*ibid.*, 723) – as an oval basin. The entrance to this basin was protected by an external burdj (for this, see n. 68 below) and system of internal chains. Its waters were shalow at the time and filled with sand, apparently the result of eroded silt brought thither by the canal from Dimyāṭ (*ibid.*, 723) which may explain the emplacement of the three « positions » in the basin (?), intended to protect the port.

22 Ibn Taghrībirdī, *Nudjūm* (Cairo 1972) XIV, 272.

23 Ibn Iyās, *Badā'i'* (Cairo 1961), V. 94; this term, pertinent in the herein context to the Mediterranean (cf. also Ibn Duqmāq, *Intiṣār* V, 53) is found in the Egyptian historiography of the 15th Century in more than one meaning: thus, when Maqrīzī (*Khiṭaṭ*, Wiet ed., 1922, III, 228) speaks about *Ayla... 'alā sāḥil al-baḥr al-milḥ* it is to be understood as the Red Sea. M. Du Bois, Aymé, *Mém. sur les Anciennes Limites de la Mer Rouge*; DE XI, 1822, 387. The term sāḥil al-Ṭīna is to be found in Ibn Taghrībirdī, *Nudjūm* (Cairo 1972) XVI, 152.

24 Djabartī, 'Adjā'ib (Būlāq) I, 28. This delineation of Ṭīna as being surrounded with marshes and the sea, is corroborated to some extent by a contemporary (1816) map of J. L. Burckhardt, *Travels in Syria and the Holy Land* (London 1822), General Map.

25 *Ibid.*, I, 33.

26 'Alī Mubārak, *Khiṭaṭ* (Būlāq, 1306/1888), XVIII, 134–135 (Muḥriz and Shaltūt relied on this statement in their interpretation of Ṭīna by Ibn Taghrībirdī (Nudjūm, XIV, 14, n. 3). Wiet set the distance between Qal'at al-Ṭīna and Port Sa'īd at about 30 kilometers; see *L'Egypte Arabe*, 554.

27 Suyūṭī, *Ḥusn* (Cairo, 1299/1881), I, 12–13, and cf. also Qalqashandī, *Subḥ al-A'shā*, III, 314–315.

28 See *Kitāb Ṣūrat al-Arḍ* (BGA II 1938–1967, 132; regarding al-Faramā, *ibid.*, 160

Lower Egypt, al-Ṭīna is therefore located close to the northern border of al-'Amal al-Thālith: al-Sharqiyya – the eastern Delta [29] (see map, Pl. XIV).

ṬĪNA IN THE MAMLŪK PERIOD

While Ṭīna, in the Mamlūk period, may be described as a port or naval base of some importance [30] in the maritime communication system of the Syrio-Egyptian coast, at least from the days of al-Malik al-Kāmil [31], followed by Barqūq [32], al-Mu'ayyad Shaykh [33] and al-Muẓaffar Aḥmad [34], an essential change in this definition came about close to the assumption of power by Barsbāy (1422–1438). The main element in this change, which increased Ṭīna's importance, was the Sulṭān's reciprocal relations with Cyprus. This it to say that, on the one hand, his desire was to contain and neutralize the official and piratical raids by sea [35] by the Franks (particularly the Catalonians) [36], especially on Egypt's northeastern

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[29] Qalqashandī, *Subḥ al-A'shā* III, 400. W. Popper, *Egypt and Syria under the Circisian Sultans*, XV, 15; in the 19th Century it was administratively subject to the District of Daqhiliyya (Mubārak, *Khiṭaṭ*, VIII, 67). In this context, one essential fact must be emphasized: Qal'at al-Ṭīna's detachment from the historical communications route; cf. R. Hartmann, *Die Strasse von Damaskus nach Kairo*, ZDMG 64, 1910, 665–702.

[30] Even though Ayalon does not categorically identify Ṭīna with the port, its importance, in the 14th and early 15th Century was meager, according to Ibn Duqmāq's testimony; see D. Ayalon, *The Mamluk Army and the Mamluk Military Society* (Heb.), MS, Jerusalem, 1946, note 51. I again take the occasion to thank Prof. Ayalon for having made available to me the paragraph in this MS. which deals with Ṭīna.

[31] See Ibn al-Dawādārī, *Kanz al-Durar wa-Djāmi' al-Ghumar* (Cairo 1972), VII, 311. This function of Ṭīna, already in the first half of the 13th Century, may be gathered from the campaign of al-Malik al-Ṣālih Nadjm al-Dīn Ayyūb to conquer Ḥimṣ in Syria, 646/1248; see Ibn Wāṣil, Mufarradj, Paris MS 1702, fols. 353 A–354 B.

[32] Maqrīzī, *Sulūk*, Cairo 1970, III 2, 490: s.a. 785/1383; Ibn al-Furāt, *Ta'rīkh al-Duwal wal-Mulūk*, Beirut 1936, XI, I, 37: s.a. 790/1388; Beirut 1938. IX, 2, 398; s.a. 797/1394; Maqrīzī, *Sulūk*, ibid., 1825; s.a. 797/1394; more clearly, Ṣayrafī, *Nuzhat al-Nufūs*, 398.

[33] See Ibn Taghrībirdī, *Nudjūm* XIV, 14: s.a. 816/1413; Sakhāwī, *al-Daw' al-Lāmi'* (Cairo 1354/1935), VI, 219. Even before he became sultan, Mu'ayyad Shaykh, having escaped the captivity of Tīmūr Lang, proceeded (circa 1400) from the Ṣafad region to the port of Syrian Tripoli so as to make the sea voyage to Ṭīna, thence by land to Qaṭyā. Regarding this route, which thenceforth became «canonic», see al-Sakhāwī, *ibid.*, (Beyrouth edition) III, 309.

[34] See Ibn Taghrībirdī, *Nudjūm*, XIV, 170–171: s.a. 824/1421; regarding the episode of Muqbil (= Sayf al-Dīn Muqbil b. 'Abdallāh al-Ḥusāmī al Dawādār; see also W. Popper, *Egypt and Syria*, Pt. IV (1422–1438), vol. 15, U.C.B.L.A. 1958, 197.

[35] Regarding the main preoccupation of the Cypriots with piracy and the location of their command post in Venetian Cyprus, see Ph. Gosse, *The History of Piracy*, London 1954, 37–38.

[36] P. H. Dopp, *Les Relations Egypto-Catalanes et les Corsairs au Commencement du Quinzième Siècle*; BFA XI/a, 1949, I, 4, 13.

coast (including Ṭīna's port and plain) [37]. Such raids obviously occurred during the reign of preceding Mamlūk sultans [38] but they kept increasing in his day (as of 1422). On the other hand was his anti-Frankish policy of dispatching reprisal and conquest expeditions against Cyprus (1424–1426); these expeditions may have outwardly been designated with the traditional spirit of the *Djihād*, but basically there was another motivation, namely, to hold in check the centrifugal forces internally [39]. Indeed, this dual and simultaneous function of defensive and offensive strategy was at the root of the change in Ṭīna: the erection of a Burdj – a position intended to give warning of enemy craft, supervise the coast, and particularly safeguard the port, which served as an intermediate base for the returning naval forces [40].

Yet this undertaking of the Burdj reveals another and no less significant aspect: on the one hand, the revival, as it were, of the ancient Pelusium–Cyprus route [41]; on the other, the policy followed by the Mamlūks with regard to the Egyptian coast was far more moderate than the « scorched earth » strategy which their naval weakness engendered – the systematic demolition of the Syrian and Palestinian coastal towns and fortresses (particularly south of Sidon (Ṣaida) down to Al-'Arīsh). The reasons for this moderate policy, as a result of which the ports and fortifications along the Egyptian coast were preserved, are, firstly, the relatively brief period of these Frankish raids; secondly, the economic objective of maintaining the transit trade, which passed through Egypt from the Far East on to Europe; thirdly, the concentration, in Cairo, of all the select units of the Mamlūk army and their ready dispatch to any point along the Egyptian coast, whose special topographic layout facilitated its supervision from the capital [42]. Indeed Cairo's security, was evidently behind this policy.

In view of the specific case of Qal'at al-Ṭīna, one might have tended to question, at first glance, Ayalon's final conclusion that « the Mamlūks paid no special attention to the Egyptian coast ». For, aside from the evi-

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[37] Cf. Ayalon, *The Mamluk Army and the Mamluk Military Society*, 70 + n. 50.

[38] Cf. 'Abd al-Sayyid, *Qiyām Dawlat al-Mamālik al-Thāniya*, Cairo 1966, 149 ff.

[39] M. Ziada, *The Mamluk Conquest of Cyprus in the Fifteenth Century*, BFA 1933, 90 ff.; A. Darrag, *L'Égypte sous le Règne de Barsbay*, IFD, Damas, 1961, 243 ff.

[40] Ziada, *ibid.*, 95; Wiet, *L'Égypte Arabe*, 554; Darrag, *ibid.*, 244, 249, 424.

[41] Cfr. Diodorus of Sicily, XVII, 47, 6–48.3 (ed. C. Bradford Wells, VIII, London 1954, 225); XVIII, 23.4–33.5 (ed. Russel M. Geer, IX, London 1957, 409). Regarding the popular tradition – prevalent in Egypt – of a land route from Faramā to Cyprus which was washed out by the sea, see Mubārak, quoting al-Kindī, *Khiṭaṭ* XIV, 74; Ibn Duqmāq, *Intiṣār* V, 53; Maqrīzī (*Khiṭaṭ*, ed. Wiet, 1922, 197), on the other hand, refers to the route from al-'Arīsh to Cyprus.

[42] Ayalon, *The Mamluks and Naval Power*, 7–11; idem., E I² I, 746–747 (s.v. *Baḥriyya*).

dent validity of al-Ṭīna's historical basis – at least as far as it concerns the forced and temporary manning of the coastal fortifications by sulṭānic Mamlūks, especially by second and third-rate garrisons – the monumental architectural testimony arising from the Qal'a (see further) would have undermined this conclusion. Actually, the nature of this qal'a, built at Ṭīna by Qānṣūh al-Ghawrī, should be defined as unique, due not only to its textual mention, which states clearly and almost unequivocally that « a qal'a was erected at the very shore along the entire Syrio-Palestinian coast in the days of the Mamlūks » [43], but also, if not primarily, because of its singular architectural features. Indeed, as will be seen, this was a most unusual qal'a both in the context of the general military architecture as well as unique in the context of the Mamlūk and Muslim architecture in particular. The very fact of its having been unusual and extraordinary is not only clear confirmation of the rule set by Ayalon; moreover, in the light of this same rule, its comprehensive interpretation should leave the confines of a narrow and immediate functional framework, as a military fort intended merely for strategic uses, and assume a symbolic, much broader context of a fort with an ideological mission.

THE CONSTRUCTION STAGES

The herein attempt, apparently the first of its kind [44], to describe Qal'at al-Ṭīna and elucidate its structural and functional history, is based primarily on an archaeological survey and the relevant literary documentation. However, until the site will have been systematically excavated, the chronological conclusions as to the construction stages will be cursory.

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[43] Ayalon, *The Mamluk Army and the Mamluk Military Society, ibid.*; also, *The Mamluks and Naval Power*, 12.

[44] Other than Fontaine's brief and at times inaccurate description (*Enquête*, 35–39) not a single systematic study has been made to date. Darrag's reference (*L'Égypte*, 244, note 4) to Ghilebert de Lannoy (1399–1450), *Voyages et Ambassades*, Louvain 1878, 130, as if having described Ṭīna in 1422, is erroneous. For aside from the fact that de Lannoy could not have described the qal'a in 1422, not even the burdj, his real interest was in Thenes (= Tinnīs, *ibid.*, 138–139; cf. also J. Webb, *Archaeologica* (Britannica) XXI, 1827, 281 ff., 406–7, which the editor (*ibid.*, 129 note 8) mistakenly identified with « Tineh, l'ancien Pelusium ». Actually, the identicalness of Tinnīs and Ṭīna may have been derived from Maqrīzī (*Al-Bayān wal-I'rāb*, 62): wa-fī al-Ṭīna wa-hiya Ṭīna Tinnīs (according to Qalqashandī, *subḥ al-A'shā* III, 401, buḥayrat Tinnīs reached Ṭīna), cfr. also the Catalan atlas of 1375 of Abraham Kreskes regarding Enes = Tinnīs, which he identified, in the same erroneous fashion, with Ṭīna: Fontaine, *Monographie Cartographique*, 58); cf. also Djalāl al-Dīn al-Suyūṭi, *lubb al-libāb fi taḥrīr al-Ansāb* (Leiden 1840), 171; in this context it should be noted, that Suyūṭi rejected the location of Ṭīna as being in the Maghrib, as claimed by Ibn al-Qaysarānī, for example, *al-Ansāb al-Muttafiqa* (Leiden, 1845) 101, and Ibn al-Athīr, *al-Libāb fī tahdhib al-Ansāb* (Baghdad n.d.) II, 296: this version was therefore likely to mi-

Stage I

(*a*) Ibn Taghrībirdī reports [45] that the building of the Burdj « near Ṭīna on the coast » [46] was entrusted by Barsbāy to the Amīr al-Zaynī 'Abd al-Qādir b. Fakhr al-Dīn b. 'Abd al-Ghanī b. Abī al-Faradj [47]. While the uncertain date of the start of construction should be set late in 1424, when the Sulṭān launched his anti-Frankish offensive (and also built the Burdj in Syrian Tripoli [48], this work, on the other hand, was apparently done in short order and completed in the Rabī' II of 828/ February-March 1425 [49]. In this construction 'Abd al-Qādir utilized the ruins of al-Faramā (then at least abandoned, since the second half of the 12th Century), taking away brick and stone, some of which was burnt for lime [50].

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slead the said editor and, following him, Darrag. Regarding de Lannoy's description of Tinnīs (for which see Maspero-Wiet, *Matériaux*, 60-61) see also Butler, *ibid.*, 355, n. 1.

[45] *Nudjūm*, XIV, 272; it should be emphasized that with regard to the structure of the Barsbāy burdj, his evidence is exclusive.

[46] This definition by Ibn Taghrībirdī suggests that the burdj was built « in the vicinity » of the port (see also n. 21). However, while its tactical reasons are quite understandable, this proximity is not in itself sufficient for locating the burdj precisely there. This leads to two questions, in principle: *a*) was the burdj built on virgin soil, or did it come in place or even on the ruins of a previous structure? This question is not entirely rhetorical, since we know of at least one other fortified structure Ḥiṣn built in the area by the Abbaside al-Mutawakkil (in 853/1239) in the framework of his fortification of the Egyptian coastal cities against Byzantine attacks) « on the Faramā seashore »; see Maqrīzī, *Khiṭaṭ* (Lebanese ed.) I, 372-373; ibn Duqmāq, *Intiṣār*, V, 53. Indeed, G. Le Pere (*ibid.*, 334) claims that al-Ṭīna's fort was built « probably » during the reign of Mutawakkil, and was destroyed, as were all his other forts in the area, by the Crusaders! Fontaine (*Enquête*, 35) unhesitatingly repeats this error. The second question is even more serious: *b*) if the exact location of the burdj is indefinite (for the moment, at least), can we argue *a priori* that it is located on the site of the qal'a? In other words, in attempting to determine the genesis and the construction stages of « Qal'at al-Ṭīna » (= the extant structure, at M.G.R/91260556 Pl. I *a,b,c*), would it be proper to designate Barsbāy's burdj as Stage I, on whose site, or ruins, the qal'a was built later (stages II and III)? Indeed, if we pursue this assumption, it would have nothing more than the technical significance of presenting the material; the ascertainement of the genetic and chronological framework will therefore have to wait for a syste matic archaeological excavation.

[47] Regarding his function as an *ustādār*, between 832/1248 and 833/1429, see Ibn Taghrībirdī, *Nudjūm*, XIV, 329, 337. The same (?!) al-Zaynī 'Abd al-Qādir is mentioned by Ibn Iyās (V, 5, under Muḥarram 922) as *Mustawfī dīwān al-Djaysh*.

[48] Darrag, *L'Égypte*, 243-244, and see below.

[49] Ibn Taghrībirdī, *Nudjūm* XIV, 272; Ziada, *ibid.*, I, 95; Darrag, *L'Égypte*, 244.

[50] *Nudjūm, ibid., ibid.*; Wiet, *L'Égypte Arabe*, 554; Darrag, *L'Égypte*, 244. A previous attempt to convert the buildings and the northern gate of Faramā - then still inhabited - into a stone and lime quarry, for building Tinnīs, was made by its ruler, Abu al-Ḥasan Aḥmad ibn al-Mudabbir (d. 883/4) see Yāqūt, *Mu'djam*, III, 883; Ibn Duqmāq, *Intiṣār*, V, 53; J. Clédat, *Le Raid du Roi Baudouin Ier en Égypte*; *BIFAO*, XXVI, 1925, 72. The consistent conversion of ancient monuments into quarries is a well-known phenomenon; here

(*b*) The ground plan of this Burdj, according to Ibn Taghrībirdī, was a square, each side 30 dhirā' long [51]. Its internal composition, as well as its construction method, will be clarified only with excavation. Until then we shall have to be content with a dim notion which may be drawn from the analogous Burdj which Barsbāy built at the same time in the Tripoli marina. Actually, this Burdj – called « Burdj al-Sarāyā » in the Tripolitanian jargon of the 19th Century – underwent a process of transformation and deformation, so that, other than its quadrangular shape and the fact that used materials (segment of columns among them) went into the building of its two storeys, nothing is known about it [52]. Therefore, without arriving at hypothetical conclusions, at this stage, from the contemporary Mamlūk fortifications architecture [53] it will suffice to assume that Burdj I in Ṭīna was an isolated two-storey tower, whose system of fortifications (like the *machicoulis* and the *chemin de ronde*) made possible its operation as a lookout and guard post [54]. These functions were carried out by the garrison, stationed there at the end of the construction: 25 armed soldiers – 15 infantrymen (?) and 10 cavalrymen [55].

(*c*) Now, in view of the limited size of the garrison (our sources say nothing about its human and military levels), as well as because of the Sulṭān's official policy of utilizing available local manpower for manning the forts, a unit (djamā'a) of « Beduin guards » (= khufarā') was settled around the Burdj [56]: the remains of the elongated brick houses containing series of small square rooms that are still scattered within a radius of some 80 meters west of the qal'a and east of it (= cemetery?), indicate its possibility with some degree of reason (Pl. XIII *a*, *c*). These Beduins, seemingly belonging to the Banū 'Udhar [57], were designated by Maqrīzī, at any rate, as

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it suffices to quote Labib Habachi, « The Destruction of Temples in Egypt », in: S. A. Hanna (ed.), *Medieval and Middle Ages Studies in Honor of A.S. Atiya*, Leiden 1972, 195–196.

51 *Nudjūm, ibid., ibid.*: *wa-Djā' murabba al-shakl misaḥat kull rub' minhā thalāthūn dhirā'*; regarding the *dhirā'*, see further.

52 M. van Berchem–Ed. Fatio, *Voyage en Syrie*, MIFAO 1914, I, 124, fig. 58; J. Sauvaget, « Notes sur les Défenses de la Marine de Tripoli », *Bulletin du Musée de Beyrouth*, 1938, II, 3 fig. 2.

53 Cf., especially in this context, Qā'itbāy's « towers » in Tripoli (1475, Sauvaget, *ibid.*, 4ff., 16ff.) and in Rashīd (1479?); E. Combe, « Le Fort Qait-Bay à Rosette », *Bulletin de la Société Royale d'Archéologie d'Alexandrie*, 33, 1939, 3 ff.

54 For the typology of the « coastal tower », see further.

55 *Nudjūm, ibid., ibid.*; Maqrīzī, *Sulūk*, MS. Paris, 1727, fol. 365 B.

56 *Nudjūm, ibid., ibid.*: *w-Anzala ḥawlahu Djamā'a min 'Arab al-Ṭīna*; Ibn Duqmāq, *Intiṣār*, V, 53; cf. also Pīrī, *Baḥrīye*, 722. Regarding the Beduins in the Mamluk military service, see al-Ẓāhirī, *Zubda*, 105; Ayalon, *Studies on the Structure of the Mamluk Army*, BSOAS XVI, 72.

57 In his paragraph on Ṭīna Tinnīs (*al-Bayān wal-I'rāb*, 62), Maqrīzī ascribes the

qaum la-khalāqa lahum wa-lā dhimām. One will therefore not be hard put to visualize the extent of the ' contribution ' by these miserable and vulnerable « guards » [58] to the efficient operation of the Burdj.

(*d*) The degree to which the Burdj effectively fulfilled its duties may therefore be determined only relatively; for, despite Ibn Taghrībirdī's statement that « the Muslims derived immense benefit from it », its value lay apparently more in supervising and safeguarding the land area – thwarting Frankish raids on Muslim caravans passing through this desolate stretch on their way from Qaṭya to Al-'Arīsh [59] – and only partially in guarding the boats which at times moored in Ṭīna's port for shelter [60].

(*e*) Our sources are not clear about the time span during which this Burdj was in operation [61]. Not only is there no clear indication of its continuous or sporadic service, but also no date is given for its final destruction. In attempting to clarify this point, it should be remembered that the military-political situation which led to the erection of the Burdj, had changed already in the year 380/1427, when Cyprus was subjugated and made tributary to the Mamlūk Sultanate [62]. True, Barsbāy's conciliatory attitude toward the Hospitalers led not only to the aggravation of their rebellion but also to piratical activity out of their base in Rhodes, against which the Sulṭān Djaqmaq sent three fruitless expeditions, between 1440 and 1444 [63]. Hence, in view of the fact that Ṭīna is not mentioned in connection with these expeditions, although on July 16, 1451 its port was attacked by 10 Frankish ships [64], it would seem that the Burdj was used

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Banū 'udhar ['udhar b. Sa'ad b. Dāfi' b. Malik b. Djusham b. Khīrān, b. Nawf b. Hamadān; cf. Hamadānī, Iklīl, Cairo 1368 H, X, 60 ff.] to the Tinnīs region. Cf. also A. A. Razqāna, *al-Qabā'il al-'Arabiyya fī Miṣr 'ind al-Maqrīzī*; *Dirāsāt 'an Maqrīzī, madjmū'at abḥāth*, Cairo 1971, 90. Regarding *kināna 'Udhra*, adcribed by him to Banū 'udhar, it is not clear, despite the presence of some of them in al-Sharqiyya (= on the banks of the Nile, in Dimyāṭ and its environs), see: Qalqashandī, *Qalā'id al-Djumān fī al-T'arīfbi-Qabā' il 'Arab al-Zamān* (Cairo 1963) 48–49, 135); *idem, Nihāyat al-Arab fi Ma'rifat Ansāb al-'Arab* (Cairo 1959), 359.

[58] The translation of *lā dhimām* as ' abandoned ', in this context, contains the double meaning of ' without a title ' and ' without protection ' (cf. Lane, *Lexicon*, I, 976). This term may be understood even better in view of the fact that the Beduins were armed with the most primitive weapons (Ayalon, *ibid.*, 11; 947).

[59] *Nudjūm, ibid., ibid.*, Darrag, *L'Égypte, ibid.*

[60] See the two separate remarks by Ibn Taghrībirdī for 13 Shawwāl 828/August 27, 1425, and a year or so later for Shawwāl 829/August 1426; W. Popper, *History of Egypt* 1382–1469, pt. IV, 40, 26, 1958, vol. 18 (1422–1438); Ziada, *ibid.*, 98.

[61] Cf. also Ayalon, *The Mamluk Army and the Mamluk Military Society, ibid., ibid.*

[62] Ziada, *ibid.*, II, 1934, 43 ff. Darrag; *L'Égypte*, 253–267.

[63] Wiet, *L'Égypte Arabe*, 582–583.

[64] See Ibn Taghrībirdī, *Ḥawādith*, 109; al-Sakhāwī, *al-Tibr al-masbūk fī Dhayl al-*

only up to 1427. Indeed, if setting this date still does not lift it above conjecture, it is nevertheless certain that, in the days of the Sulṭān Īnāl, the Burdj was at least non-operative, if not actually in ruins. This is indicated by Ibn Taghrībirdī's report about the trip made to Ṭīna (on 17 Rabī' II 865) by the two Amīrs, Birdibak, al-Dawādār al-Thānī and Nāṣir al-Dīn b. Abī al-Faradj, Naqīb al-Djaysh, to examine the site on which they wished to erect a Burdj [65]. The conclusion to be drawn from this report is that, early 1461 or even late 1460 (when several Muslim ships on their way back from Cyprus to Cairo – 23 Muḥarram 865/November 7, 1460 – were tossed onto the shore at Ṭīna) [66] is not only the latest date for Burdj I but also for its total destruction, for if it had still been in existence, even in a dilapidated state, it is doubtful that the Sulṭān would have ordered the two Amīrs to build a completely new Burdj on the spot. However, the same report raises the question as to whether as of then (= 1461) a second Burdj really existed there (attributable perhaps to Īnāl). This is not certain, not only because Ibn Taghrībirdī's statement explicitly expresses the intent to built it rather than actual erection, but also because in the present constellation, i.e., generally peaceful relations and Mamlūk-Lusignian cooperation, it is doubtful that a Burdj was needed there at all. True, Īnāl's intervention in the power struggle in Cyprus and his active support of the claim of Archbishop Jacques of Nicosia to the crown (the Archbishop was hiding in Cairo from Charlotte and Louis of Savoy) led the Sulṭān to « crown » him and send him back home with the help of the Egyptian navy [67]; it cannot be assumed, however, that Ṭīna played any sort of role here – not in the incident itself nor in the return of the remnants of the defeated Egyptian navy to Egypt (?). However, despite the plausibility of this latter assumption, there might still have been another motive, as yet unclear, which induced the order to the two Amīrs to build a new Burdj at Ṭīna [68].

Sulūk (Būlāq 1896), 351; G. Wiet, *Une Inscripton du Sultan Djakmak*, BIE XXI, 1939, 79–80 (quoted in Aḥmad Darrāg, *al-Mamālik wal-Firandj*, Cairo 1961, 68).

[65] *Nudjūm* XVI Cairo 1972, 156. At the same time, from the different versions of the same information in the *Ḥawādith* (*ibid.*, 348) it is evident that the two Amīrs were dispatched to Ṭīna by the Sulṭān « *li-'Amal burdj* ».

[66] *Nudjūm* XVI, 152: in this information, at any rate, there is no mention of a *burdj* at Ṭīna!

[67] Ziada, *ibid.*, II, 52–59. Ayalon also states (*The Mamluk Army*, ibid.), that nothing can be learned from the sources about the nature and period of the new burdj.

[68] In this context, we may refer to al-Ẓāhirī's obscure statement (*Zubda*, 34): *wa 'amara hunāk al-Malik al-Ashraf taghammadahu Allāh bi-Raḥmatihi burdjayn*; to the extent that the statement relates to Ṭīna, it may be correct to interpret it that both al-Malik al-Ashraf Barsbāy and al-Malik al-Ashraf Ināl built a burdj there. Such interpretation would be based on the fact that al-Ẓāhirī mentions the Sulṭān's title but not his name; since the

After the supposed neutralization of Burdj I in 1427 and its evident destruction in 1461, 47 years passed for which there is no mention of a fortified structure at Ṭīna, in the historical sources. This fact seems to prove the minor importance attached by the later Sulṭāns to the fortifica-

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title, in this context, was common to Barsbāy and Ināl, he may have therefore meant both of them (it should also be borne in mind that al-Ẓāhirī was their contemporary). Now, if the statemente does indeed relate to Ṭīna, then the *burdjayn* may be easily explained, namely, that one was built by Barsbāy and the other by Īnāl. Even though this interpretation is no more than speculative, it is doubtful that the *burdjayn* can be ascribed to only one of them – neither to Barsbāy (as Ayalon assumes, *The Mamluk Army*, *ibid.*) and certainly not to Īnāl.

Indeed, this vagueness (arising from the two divergent reports by Ibn Taghrībirdī as well as from al-Ẓāhirī's statement) regarding the definite location of the two *burdjs*, may be resolved by another conjectured interpretation: while the first burdj – Barsbāy's – was actually built in Ṭīna, the second – Īnāl's – was built about 12 kilometers, as the crow fiies, northwest of it, near the estuary of the Tanitic branch of the Nile (cf. DE, XVIII, 175; Baedeker (*Lower Egypt*, 1895, 192) sought to identify it with the canal *baḥr mūays* [= Mu'izz] as it was named then, as today, and so noted on the Al-'Arīsh map (Sheet 4491:250,000: Pl. XIV) as Qal'at Umm Mufarraḥ, This interpretation may be based on two considerations: firstly, as to its name, *Qal'at Umm al-Mufarraḥ* is but a distortion of the name, still widespread at the beginning of our century (see Na'ūm Shuqair, *Tā'rīkh Sīnā'*, 182) itself a distortion of *Qal'at Umm Faradj* (cf. Fontaine, *Enquête*, 39); while the identity of Umm Faradj is still unclear, it is not impossible that the name is a distortion of « Abū al-Faradj », the name of Naqīb al-Djaysh, who was dispatched by Īnāl in February 1461 to build the burdj. And indeed, this burdj also forms the basis for the second consideration: for, in its rectangular (8 meters × 12 meters) plan as well as its clay brick construction, the structure corresponds – at least in its present appearance (cf. *Archaeological News*, 37, Jerusalem 1971, 32) to the term 'burdj' rather than to 'qal'a'. To the extent that this burdj was Īnāl's work, then its existence span may be set as at least from 1461 to at least 1799, when it served the French army as a depot along the Dimyāṭ-Ṭīna-Qaṭya supply line (see Fontaine, *ibid.*, 39; for the water supply via the Abū Faradj canal, see C. de la Jonquière, *L'Expédition d'Égypte*, IV, 24; and further). Thus, this attempt to explain the problematical matter of the location of the burdjayn might have received confirmation from Pīrī's statement (*Baḥriye* 722), that « the Egyptians built a burdj to guard the entrance to the Port » [of Ṭīna]. However, rather than offering solutions, this statement leads to two questions: first, if this burdj was indeed built by Barsbāy (see note 46 above), how could one explain the fact that its erection took place – according to Pīrī – west of the qal'a? The question posed by Pīrī's words and map is simple yet difficult: if the burdj was built after the erection of the qal'a – if not after its demolition or actual abandonment (see note 99 below), can we nevertheless attribute it to Barsbāy at all? That fact that, in his map (*ibid.*, 723), Pīrī marks only the burdj but not the qal'a, merely aggravates the question, for it nullifies the possibility of the two edifices standing next to each other, at any time. However, lacking as it does any historical-chronological and archaeological-topographical basis, this possibility seems far-fetched indeed. The second question then arises: if the burdj is not Barsbāy's, perhaps it is the burdj built by Īnāl at Umm Faradj? This could be possible, were it not for Pīrī's note that it was erected definitely in connection with Ṭīna's port. This is to say, that since Pīrī's statement – regarding a burdj erected west of the qal'a – cannot be comprehended in a regional context, only local, then

tion of the site, even though it was still vulnerable to Frankish incursions, such as was thwarted by a large expedition in the days of Qā'itbāy (Rabī' II 877/1472) [69]. After this long gap, which saw seven sulṭāns on the throne (from Khushqadam to Djanbalāṭ) the structure is mentioned again in 914/1508. In this year, the eight of his reign, Qānṣūh al-Ghawrī (1500–1516), acting in line with his anti-Frankish and anti-Portuguese struggle in particular, and striving to strengthen his sultanate's military power in general, set out to execute a comprehensive and systematic royal program for the fortification of the Egyptian sector of the Mediterranean, and in the Red Sea and the Indian ocean [70]. The fortification of Ṭīna – one of these components, part of the strategic employment but unique as well – was done in two main stages – II and III. These stages are clearly distinct both in their periods, according to our main source here (Ibn Iyās, whose interest in military matters was limited, however, at least in comparison with Ibn Taghrībirdī), as well as in their plan, in the present structure and composition of the monument (see further).

Stage II

(*a*) Ibn Iyās reports [71] that the building of the « abrādj » [72] on Ṭīna's coast [73] was assigned by Qānṣūh al-Ghawrī to the Amīr al-'Asharah

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the possibility of the burdj being Īnāl's enterprise at Ṭīna would necessarily revert the question to its beginning. This situation must perforce remain in the thick of its complexity, particularly since Pīrī's testimony was that of an eye-witness; (regarding his three visits to Egypt, especially the one which coincided with the Ottoman conquest in 1517, see Svat Soucek, *A Propos du Livre d'Instructions Nautiques de Pīrī Re'is*, *ibid.*, 251, n. 2).

[69] Ibn Iyās, Badā'ī', Istānbūl 1936, III, 76.

[70] D. Ayalon, *Gunpowder*, 48 ff. Idem, *The Mamluks and Naval Power*, 11. Regarding the Sulṭān's fortification works, see also Sh. Tamari, « Darb al-Ḥadjdj in Sinai: the Qal'a at Nakhl », *Hamizraḥ Heḥadash* (' The New East '), XXIII/2, 1973, 162.

[71] Badā'ī', Cairo 1960, IV, 147, 158–159.

[72] At this stage, a categorical definition of the « *abrādj* » is difficult – if not impossible, for three main reasons: first, the different lexical meanings of the term (see, for example, Ibn Manẓūr, *Lisān al-'Arab* (Beirut 1955) II, 211–212; al-Zubeidi, *Tādj al-'Arūs* (Beirut 1966) II, 7; al-Azharī, *Tahadhīb al-Lugha* (Cairo, undated) XI, 55; Lane, *Lexicon*, I, 180; Dozy, *Supplément aux Dictionnaires Arabes*, I, 64–65; G. S. Colin, EI², I, 1315; secondly, the absence of a strict typological classification of the term in its complicated architectural context (despite the synthesis – important in itself – of Sourdel et alii in EI², I, 1315 ff. s.v. (*Burdj*); thirdly – and emphatically – the absence, for the present, of archaeological excavation. Under the circumstances we shall have to be satisfied with adopting two as sumptions: the first, of a negative nature, is to detach Ibn Iyās' sentence from its literal expression, as if the Sulṭān had built « [various] towers on the coast »; the second, of a positive nature, is that the *abrādj* be defined as a single isolated complex whose architectural implications may have indicated two possibilities, separate or integrated: first, the *abrādj*, as

(n. 73 see p. 16)

(commander of a 10–man unit) Timur Bāy al–Hindī [74]. The date for the start of the work should be set, at the earliest, on Dhū al–Qa'ada 914/ February–March 1508 when the Amīr was already there; its termination, at the latest: Rabī' II, 915/July–August 1509, when he returned to Cairo and was awarded the « Robe of Honor » [75]. The nature of the building materials used is not stated in the sources; however, if, once the site is excavated, our assumption (see Note 46) is confirmed, namely, that Structure II was indeed built on the site or on the remains of Burdj I, then it will be evident that the same Faramaic stones and bricks were used also for the new building. For the present, this likelihood is supported by the present in loco of the burnt red bricks and white stones, still extant, plus the fact that there are no other sources of building materials in the locality (unless we assume that these, too, were taken from the « main quarry » of Tel Faramā!).

(*b*) The plan of Structure II, for which there is no textual evidence, consists of two main complexes. Out of considerations of planning and performance, to be clarified later, it would appear that both were planned and executed at the same time: II_1 – an internal octagonal structure; II_2 – a perimetric octagonal structure. Between the internal and the perimetric structures, the latter about 6.80 meters away, there is a perimetric court.

Complex II_1 (figs. 1, 4).

This complex consists of four main internal components: 1) the *entrance* this sole external gateway of the inner octagon (might have been closed by a door of iron–covered oak) leads to a trapezoid corridor (1.50 m. × 2.20 m.; Pl. III *a*, Fontaine, *Enquête*, 36) north of which there is a cross–vaulted foyer (A = 3.00 m. × 3.20 m.; the center of the vaulting is fashioned in a octagonal design, etched into cement plaster, the same that covered also the inner walls; (Pls. III *b*, IV *a*); farther northward is an almost square room (2.72 × 2.20 m.), D, which serves as an anteroom to (2) the *central court* (8.30 × 8.30 m.). This court was probably domed, at one time (it is

« towers », referred to the two octagonal complexes; secondly, the *abrādj* also as « corners » indicated corner towers, located in the perimetric octagonal complex. Should these assumptions be corroborated by excavation, the transformation of Stage III (further), according to which the entire complex was converted into a qal'a (which, according to Ibn Iyās, contained an *abrādj*, as well) will be correctly understood.

[73] Regarding the definition of the term « *sāḥil al–baḥr* », cf. 'Ali Mubārak (Khiṭaṭ XIII, 68) who refers – albeit in connection with the qal'a – to « Fumm baḥr al–Ṭīna » (the definition noted also in DE, XVIII/3, 175, and see also note 21.

[74] Al–Sakhāwī (*Al–Tibr al–Masbūk fī Dhayl al–Sulūk*, 63) notes s.a. 847/1443, Timur Bāy as « *Rās al–Nawaba al–Kabīr wa–lahu amr al–baḥr* »!

[75] Badā'ī', Cairo 1960, IV, 147, 158–159.

rather impossible, at this phase, to ascertain the structural method of this presupposed dome, i.e., either the so-called « Cupola a Padiglione » or « Cupola ad Ombrello »; for these two types of dome construction see G. de Angelis d'Ossat, « Sugli Edifici Ottagonali nell'Antichità e nel Medioevo », in *Atti del I Congresso Nazionale di Storia dell'Architettura*, Firenze 1938, 66 ff.). From this court there were seven ogival arched openings (2.67 to 2.72 m. in width; for the thickness of the walls, see further) lead to (3) *seven anterooms* – F, H, K, M, O, Q, R (Pls. II *b*, *c*; IV *b*) of dissimilar trapezoid plan: their external widths fluctuate between 2.67 and 2.72 m., their internal widths between 2.86 and 2.90 m., and their depths between 2.55 and 260 m. (4) Each of the seven anterooms leads to one of the *seven main* rooms – E, G, J, L, N, P, S, of a more or less identical rectangular plan and crossvaulting design: 2.90 × 4.80 m.; according to Fontaine (*ibid.*, 36) these rooms were illuminated from the outside by semi-arched windows. The four internal components were laid out on one floor, each wall of the eight sides being about 9.00 m. long and 1.35 m. wide.

Complex II_2 (figs. 1, 4).

Only some of the elements of the internal western wing of this destroyed perimetric octagon are visible today; their examination and measurement are therefore contingent on their presumed reconstruction, as follows: (1) in the center of the southern side is the sole external entrance (according to Fontaine – *ibid.*, 39 – there were « probably » four entrances at the four cardinal points (?!) AA, (Pls. V *a*, *b* VII *a*), which altogether served as the main entrance to the entire monument. Its location on the axis of the internal entrance (A) and on the one pillar (0.83 × 0.50 m. [× 0.83 m.]) still extant on the western line of the doorpost make it tenable to assume that its composition was identical with that of the internal entrance; this is to say, there was access to the perimetric court through a corridor leading to a porticoed anteroom, the portico resting on two pillars. (2) The western side of the octagon (PP) bordering on the perimetric court, is about 15.90 m. long internally and contains the following elements (from south to north; Pls. VI *a*, VII *b*): a wall 2.50 m. long; an opening 2.50 m. wide; a square pillar (0.83 m. × 0.83 .); an opening 2.50 m. wide; a pillar-wall 1.05 m. long; an opening 0.90 m. wide, and a wall 2.50 m. long. This layout, to be clarified further, thereby forms a portico, whose three identical openings faced on to the perimetric court. Since its depth cannot at this phase be determined, a tentative reconstruction must of necessity suffice (actually more valid for III, further), according to which the internal side of the octagon is taken up by a rectangular hall; in its internal disposition, this hall may have contained three *travée* and two bays, perhaps linked on one side to the three bays and, on the other side, opening on to the perimetric

court (the northern opening – 0.90 m. – points to such a possibility). (3) The presence of several similar elements also on the southwestern side (SS; Pl. VI *b*) – a wall 2.50 m. long, an opening 9.90 m. wide, a wall 1.00 m. long, an opening 2.50 m. wide, and a square pillar 0.83 m. × 0.83 m.) – may justify the assumption of a similar spatial dispostion of a rectangular hall, consisting of two *travée* and two bays (see further). (4) Although the reconstruction of the above two sides does not go beyond experimentation, for the time being, it may neverthelles be assumed that the comprehensive layout of the perimetric octagon consisted internally of seven rectangular halls, open on their facade, via a portico, on to the interior of the perimetric court and closed off at their rear by solid walls. (5) The external facades of these walls were designed apparently with rectangular recesses; an indication of the latter in the center of these walls is the angle PX (Pl. VI *a*) between the remains of the two walls at the northern extremity of the western wall. The remains of the wall, still extant in loco in the northern side LL, are therefore but the internal wall of the recess, assumed to be at the center of the northern wall of the perimetric octagon.

(*c*) Even though the definite function of the two complexes is not made clear in our sources, it may not be incorrect to regard the first as the « command post » and the second as the « logistic complex » (barracks, storerooms, stables, and the like). From the standpoint of the location of the garrison, defined as to its quality but not its size, the command post may have quartered the mamālīk and perhaps also the Awlād al-Nās [76], while the Khufarā' [77] set themselves up, somehow, in the logistic complex and outdoors. The manpower in the command post varied in size, since the mamālīk and the Awlād al-Nās were stationed alternately, there as in other forts, for a stint of only one year [78]. This situation necessarily leads to the assumption that manning the logistic complex centered on the permanent presence (?) of the khufarā', for it would seem that this complex,

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[76] Despite the lowly status of Awlād al-Nās, who comprised the elite of the Ḥalqa regiment, it is not evident that, in the case under discussion (17 Rabī' II 915), they served as arquebusiers; their station might therefore have been with the Mamlūks at the command post rather than in the logistic complex; see Ayalon, *Gunpowder*, 64–65.

[77] Regarding the presence of Mamālīk and Khufarā', Ibn Iyās reports (*ibid.*, IV, 146) in connection with the commencement of construction in Dhū al-Qa'ada 914, at that time they helped Timur Bāy throw back a Frankish incursion, taking 27 Franks prisoner and capturing one vessel. Regarding Selīm I's appointment of Beduins as guards – in return for an annual wage – in Egyptian provinces, see Cezzār Aḥmad Pasha, *Niẓāmname-i Miṣir*; ed. S. J. Shaw, *Ottoman Egypt in the Eighteenth Century*, Cambridge, Mass. 1964, 8/27.

[78] Ibn Iyās, *ibid.*, IV, 157–(159): for 17 Rabī' I 915. Regarding the unwillingness of the Mamlūks to serve in the coastal forts, and their forced stationing there, see Ayalon, *Gunpowder*, 81; *The Mamluks and Naval Power*, 11.

rather than the internal command post, should have served as the principal fortified system, by actually functioning as the first perimetric line, manned continuously (?) and altogether performing the offensive and defensive functions.

Stage III

(A) Qānṣūh al-Ghawrī's conversion of the Abrādj into a Qal'a took place in the final and critical years of the Mamlūk reign, when, in addition to the attack on Ṭīna [79] by Rhodian pirates in 1509, the threat of the Othmans was already looming on the horizon, at least with the reign of Selīm I (1512–1520) [80]. The transformation process may well have begun in Djumādā I of 915 (1509) but certainly after Rabī' II 915, which marks – as already noted – the completion date of structure II; the end of the process is 18 Djumādā II 916 (1510), when Ibn Iyās [81] first notes – almost offhand but most significantly for our study – the term *qal'a*. Then, in view of the intensified Frankish attacks, the Sulṭān appointed the governor (= N ā ' ī b) of Qaṭya [82] Amīr Alf (commander of 1,000) Qānṣūh Rūḥ-Lū (Or Ruḥluh), commander of the Ṭīna garrison, the one that contained a unit (djamā'a) of sulṭānic Mamlūks [83].

(B) From the structural viewpoint, the object of the transformation was structure II itself; that is, it deals not with the demolition of the previous edifice and the construction of a new one in its stead, but with the several alterations and additions introduced thereinto. These are to be found in the two principal architectural complexes of the internal octagon, III_1, and the perimetric octagon III_2 (see further « reconstruction »).

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[79] A. Darrag, *Les Rélations Commerciales entre l'Etat Mamlouk et la France*; BFA XXV/2, 1963, 13.

[80] Despite the Othman-Mamlūk cooperation in the last years of Bayāzīd II's reign (cf. H. Inalcik, « The Social and Political Effects of the Diffusion of Firearms in the Middle East », in: Parry-Wapp, *War, Technology and Society in the Middle East*, London 1975, 202–203) we know that the Mamlūks, in the days of Qānṣūh al-Ghawrī, feared at least some massive Othman naval attack, just as we know the reasons for the Ottoman warfare against the Mamluks; see A. C. Hess, *The Ottoman Consquest of Egypt (1517) and the Beginning of the Sixteenth-Century World War*; International Journal of Middle East Studies, IV, 1973, 55–76, 67–69 + n. 3.

[81] *Badā'i'* IV, 192.

[82] See Aḥmad ibn Zunbul, *Ta'rīkh al-Sulṭān Selīm... Ma' Qānṣūh al-Ghawrī* (lithograph ed., Jerusalem R 48, C 1175), 3. For the military and political career of Qānṣūh Rūḥ-Lū, who served as Nā'ib of Gaza, Aleppo (906/1500) and Tripoli (910/1504) and as the chief commander (= Atābik al-'Asākir) in Damascus (911/1505), see Shams al-Dīn ibn Ṭūlūn, *Mufākahat al-Ḫulān fī Ḥawādith al-Zamān*, Cairo 1962, I, 235, 236, 286, 292. See further.

[83] *Badā'i'*, IV, 192–193.

Complex III_1 (figs. 1, 5)

(1) Two stairways, B and C (Pl. VIII *a*, *b* + Pl. IX *a*) were built on the two sides of entrance A, leading in right-angle turns to the mezzanine and on to the second and third floors. (2) In order to put in the stairways, rooms E and F were partly blocked off on the east, as was room S on the west (see further). (3) Room R (Pl. IX *b*), which originally – in Stage II – served as an anteroom of S, therefore became a room in itself (1.85 m. × 2.90 m.), probably used as a mosque. Two structural alterations may indicate this change in function: first, the arched opening design of its entrance (0.90 m. wide); secondly, the barrel-vaulted design of its ceiling. Even though, in the present ruinous state of the room, which directly faces the *qibla*, there is no sign of a *miḥrāb*, it may well be that this is the room mentioned by Ibn Iyās [84] in his statement that there was a « djāmi' » in the qal'a. (4) The second floor (fig. 3), built on the foundations of the exterior wall, on the one hand, and on the massive blocks between the rooms on the first floor, on the other, probably contained (1) two stairways B1/C1 (Pls. VIII *a*, *b*, IX *a*) in its southern wing, separated by room A1 (Pl. XI *b*); (*b*) room E1 (Pl. XI *a*) on the southeastern side (3.50 m. × 2.50 m.) and S1 on the southwestern side; (c) three rectangular rooms (G1, Pl. X *a* L1, P1) and two trapezoidal rooms (J1, N1); this series of rooms, separated by walls 0.55 m. wide, opened via eight openings (1.00 m. wide) on to a gallery, whose internal wall bounded the wall of the central court. (5) This central court, probably domed in Stage II, was now open to the sky; such a conclusion may presumably be reached because of the blocking up (partially, at present) of room K (fig. 1), that is to say, if the section of the wall which blocks the opening from K to the central court may be regarded as an indicator of the blocking up of all the other anterooms on the ground floor, then it would be correct to conclude that the dome of the court had been removed (but cf. Fontaine, *ibid.*, 35–36 + note 4, as he sought to find the remains of the dome). It is therefore reasonable to assume, that once the central court had been opened to the sky, gateways (which could be closed off with doors) were made in all the anterooms on the first floor. (6) In view of the thickening of the external wall of the building facade, on both sides of main entrance A and of the extension of stairway B above the second floor, it would apparently not be incorrect to consider the exi-

[84] *Badā'i'*, Cairo 1961, V, 94; to the extent that *Djāmi' bi-Khuṭba* refers to *Djāmi'* and *Khuṭba* (cf. Ayalon, *The Mamlūk Army*, ibid.) despite its frequent mention also by Shams al-Dīn Muḥammad b. Abi Surūr al-Bakrī, *al-Tuḥfa al-Bahiyya fī Tamalluk āl 'Uthmān al-Diyār al-Miṣriyya*, Ms. Vienna Codex Vindobonensis AF 283, no. 925, OR 457, fol. 19 B (cf. also al-Sharqāwī, *Tuḥfat al-Nāẓirīn*, II, 82–83; at the margins of pseudo-Wāqidī); this term is worth studying.

stence of a third floor in the southern part of the structure (fig. 2; Pls. X *a*; XII *a, b*; also J. Clédat, BIFAO, XXII, fig. 2: *Péluse – Ruines de la forteresse arabe El-Tineh* and M. Brodrick, *A Handbook for Travellers in Lower & Upper Egypt*, London 1900, 519).

Complex III_2 (figs. 2, 5)

In the present state of the perimetric octagon – completely demolished – only two structural alterations are discernible: (1) the break of the straight line of the western 'doorpost' wall, in the external entrance, which apparently forms a polygonal side room (fig. 1); if such indeed is the case, then the external «entrance» to the structure would be laid out as follows: *a*) a corridor leading to a square anteroom (AA, Pls. V *a, b*; VII *a*), flanked on both sides by *b*) two polygonal rooms; the three rooms open, via a portico of three arches resting on two pilasters, on to the perimetric court (fig. 5). (2) the addition of a wall with niches in it at the northern end of the western side PP (figs. 1, 5, Pls. VI *a*, VII *b*); even though the nature and purpose of this 'wall' are not sufficiently clear, it may have been intended to separate, by means of two pilasters and two openings with a window in between them, the elongated rectangular hall from the fianking room north and south (?) of it (fig. 5). At any rate, on the basis of this assumption it is possible to reconstruct tentatively the entire internal space of the perimetric octagon.

(C) The transformation in Stage III is of twofold significance: (1) structurally there is an extra emphasis on the inner octagon, so as to make it appear a fort within a fort. Indeed, even if this internal structure (which gives some impression of having been a *donjon*) or any other particular element connected with its system of fortifications (such as corner towers; see aerial photographs Pl. I *b, c*) does not have to be regarded as an exact equivalent of the *abrādj*, it is altogether clear – according to the conclusion reached by Ibn-Iyās himself [85] – that, after its transformation, the qal'a contained *abrādj*, as well. In other words, the previous Stage II complex (a complicated and isolated unit, as already noted) now became, in Stage III, more intricate and perhaps even more sophisticated, preserving, at any rate, its autonomous and articulate character. The explication which Ayalon [86] sought to give to Ibn-Iyās' foregoing statement, as if further towers were built in Ṭīna in addition to the qal'a, would therefore appear to be uncer-

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[85] *Badā'i'*, V, 94: sub Ramaḍān 922: *wa-Anshā' bil-Ṭīna 'alā sāḥil al-baḥr al-māliḥ Qal'a laṭīfa bihā abrādj...*

[86] See *Gunpowder*, 113, n. 16... «and a fortress (Qal'a) together with more towers in at-Tina»; at the same time, in *The Mamluk Army, ibid.*, Ayalon phrased his statement in literary similitude to Ibn Iyās: «... *Qal'a laṭīfa* with *abrādj*».

tain. (2) With regard to the personnel, the architectural–functional transformation is explicated by the appointment of a senior commander, of higher rank and greater experience (see further), whose subalterns were from among the elite of the sulṭānic Mamlūks. Indeed, even though the permanent residence of this commander – the Amīr Qānṣūh Rūḥ–Lū – was in Qaṭya, it is doubtful that the immediate factor of Frankish attacks should have been the sole consideration in the building of the qal'a, as Ibn–Iyās does indicate [87]. The fact that the sulṭānic Mamlūks were present there, apparently further reinforced (in Djumādā I 918/1512 at the latest) [88], may make possible the assumption, that in building the qal'a, Qānṣūh al–Ghawrī might have also considered some future threat from the Ottomans [89].

(D) The architectural transformation, which shifted the tactical center of gravity from the external octagon to the internal, and the determination of the new plan as an effective answer to the eventual Ottoman threat, now make it possible to assume the presence of artillery (albeit locally and in a limited fashion). Even though we have no textual confirmation of this assumption, it may be bolstered by the massive Ottoman use of firearms (actually characteristic of the naval attacks by the Frankish gunboats on the coasts of Syria and Egypt, in that period, and even more so, in view of its introduction into the Mamlūk Army itself, already in the 1360's. Despite the revulsion and objection of the Mamlūk military society, despite the lack – or at least the paucity – of the materials required for building cannon, and despite Egypt's critical economic situation since the beginning of the 15th Century, the use of firearms kept spreading until, in the days of Qānṣūh al–Ghawrī, it reached considerable proportions. For at that time the Sulṭān put into operation an unprecedented and systematic program for artillery production, emplacing it, mainly, in the Egyptian ports and the coastal fortifications of the Mediterranean and the Red Sea [90]. Moreover, the very fact that artillery was used in siege campaigns (or even in naval campaigns against the Portuguese, rather than in the field – the most severe problem in the framework of Mamlūk strategy – makes it reasonable that artillery would now be emplaced in Ṭīna, as well [91].

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[87] *Ibid.*, IV, 192, and cf. Ayalon, *Gunpowder*, 113, n. 16.

[88] *Ibid.*, IV, 272; in that year, as said, Selīm I mounted the throne!

[89] See Ayalon, *Gunpowder*, 80–81; M. M. Ziada, The Fall of the Mamluks, BFA, VI, 1942, 14–16.

[90] See Ayalon, *Gunpowder*, 48 ff. Also EI², I 1059 (s.v. Bārūd).

[91] See C. Oman, *A History of the Art of War in the XVIth Century*, London 1937, 623; Ayalon, *Gunpowder*, 133, n. 16.

Now while this assumption may have reliable grounds, in theory and principle (emphasis should be placed on the presence of artillery in the qal'a in the Othmanic and apparently also in the French phase; see further), there is no possible answer, under existing circumstances, to the concrete question of thd composition of that artillery – its quantity, emplacement, and who were its operators. This is to say, that in view of the absence of archaeological excavation and the silence (not surprising in itself) of Ibn Iyās on the subject, we can only assume, in the meantime, that this artillery consisted of ' light cannon ', set up perhaps in the perimetric octagon, or on the roof of the internal octagon. On the other hand, deployment of these cannon at 330° enabled them to exercise effective control [92] of the area: north toward the sea, south toward the land route. As for the operators, these may have been the Awlād al-Nās or even the Mamlūks themselves: despite their negative attitude toward the artillery and their socio-psychological opposition to it, further aggravated by faulty discipline and internal strife, this attitude – at least on the part of the Awlād al-Nās [93] – could have changed under the impact of contemporary critical circumstances.

While the offensive application of artillery is not certain, its use in defense is much more plausible, for with the conjectured removal of the dome over the internal octagon and with the consequent opening to the sky of its central court, a natural void was created along the entire vertical axis of the structure. This void could therefore be regarded as an air stack, possibly to draw hostile shells and channel them into a dead area; channeling, as it were, the fire bombs and explosives into the central court, where they would be contained as in a « security pit », might have neutralized not only the roof of the inner octagon (where the garrison force was stationed) but also, in some measure, the relatively weak construction of the upper brick structure, which, if hit, would crumble. (Such a solution occurred in the S. Michele coastal tower, erected to provide protection against piratical Muslim attacks, 1,700 meters away from the present location of the Tevere estuary. Its octagonal plan – three floors, 18 meters high and 18 meters wide on each side – was designed by Michelangelo, using the most advanced fortification technology, defensive and offensive, of his day. The construction work was finished by Giovanni Lippi in 1568. Cf. G. M. de Rossi, *Torri Costiere del Lazio*, 57–58, and below Note 209).

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[92] While the ranges of these hypothetical cannon are not known, Ibn Taghrībirdī's exclusive description of the experimentation with the royal cannon of the Sulṭān Khushqadam (1461–1467, quoted by Ayalon, *ibid.*, 135–137), as having a range of four kilometers, allows us to determine their theoretical efficiency also in our case.

[93] See Ayalon, *Gunpowder*, 64ff., 86ff. The presence of Awlād al-Nās at the qal'a until late 922/1516 is indicated by Ibn Iyās, *Badā'i'* V, 133, and see further.

Stage III A

(A) After a period of six and a half years, dialectically marking the peak of the qal'a's history in the final years of the Mamlūk sultanate, it was captured by the vanguard of the Othman forces (between the 7th and 20th Dhū al-Ḥidjdja 922/16th and 29th January 1517)[94]. Indeed, the defeat of Mardj Dābiq – (August 24, 1516) apparently caused not only the southward retreat of the surviving Mamlūk troops in Syria but also the abandonment of Qaṭya by its governor and soldiers, as they fled to Egypt[95]; for when Selīm I arrived there, according to Ibn Zunbul[96], he didn't find a single soldier in the area. Under these circumstances it would be logical to assume, despite Ibn Iyās' uncertainty[97], that Qal'at al-Ṭīna was also abandoned, falling into the hands of the Othmans without a struggle. But regardless whether its capture took place during the three days the Othmans were in Qaṭya, prior to marching on Bilbīs[98], or at the same time of their entrance into Qaṭya, what is of prime significance here is that the qal'a was seemingly undemolished and intact when it was taken[99]. This statement may be proven on textual as well as on archaeological grounds; on the one hand, the qal'a operation continued during the Othman occupation

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[94] Ibn 'Iyās, *Badā'i'*, V, 133. According to al-Bakrī (*Tuḥfa*, fol. 25 B), the Othman troops reached Qaṭya on 20 Dhū al-Ḥidjdja 922.

[95] The flight of Qaṭya's ruler – Qānṣūh Rūḥ-lū – is also indicated in his subsequent appointment (15 Dhū al-Ḥidjdja 922) by Ṭūmān Bāy as governor (= kāshif) of al-Sharqiyya; see Ibn Iyās, *Badā'i'*, V, 135; al-Isḥaqī, Akhbār al-Uwal fīman taṣarrafa fī Miṣr min-Arbāb al-Duwal, Ṭab'at al Azhariyya, 1311 A.H., 144, 148. In this connection it is worth noting that, several months earlier (25 Rabī' II 922) the governor of Qaṭya met there with Qānṣūh al-Ghawrī, on his way northward (al-Bakrī, *Tuḥfa*, fol. 10 B).

[96] Ibn Zunbul, *Tā'rīkh al-Sulṭān Selīm*, 30. Actually, the log of Selīm's expedition from Syria to Egypt and back makes no mention at all of al-Ṭīna; see Halil Edhem, *Tagebuch der Ägyptischen Expedition des Sultans Selim I*, Weimar 1916, 17, 26.

[97] *Badā'i'*, V, 133.

[98] Ibn Iyās, *ibid.*, 141; Ibn Zunbul, *ibid.*, 30; al-Bakrī (*Tuḥfa*, fol. 25 B) reports that' on 20 Dhū al-Ḥidjdja (that is, on the day after the arrival of the troops in Qaṭya), they left for Bilbīs. Cf. also al-Sayyid al-Ruqād, *al-Ghazū al-'Uthmānī li-Miṣr wa-Nitādjuhu 'alā al-waṭan al-'Arabī*, Alexandria 1972, 182.

[99] Pīrī's sentence (*Baḥriye*, 722) about the qal'a's being « kharāb » can hardly be accepted as proof of the destruction of the fort. So long as the cause of such destruction has not been clarified and proven (whether by an Othman-Mamlūk siege/battle, or by the Mamlūks themselves, or – the least plausible – some kind of demolition following the conquest), it would be most reasonable to interpret it as indicating its desolate state, at least until 1526 (the date of *Kitāb-i Baḥriye's second version*). Regarding Selīm's relatively uneventful campaign to Egypt, see G. W. F. Stripling, *The Ottoman Turks and the Arabs*, 1511–1574, Urbana 1942, 53–54; M. Ziada, BFA VI, 1942, 27; C. Oman, *A History of the Art of War in the XVIth Century*, 622.

of Egypt (at least until the first half of the 18th Century) [100], and on the other hand, probably no structural alterations were made in it during the Othmanic stage.

(B) The continuity of the architectural (and strategic) features of the Mamlūk qal'a came apparently from the Othman desire to keep it unaltered. However, the continuity of its active military functioning is questionable. For despite the report by Evliyā Çelebī [101] of the existence, in the qal'a, of 30 cannon, a gunpowder depot and 100 soldiers (in the 1680's), their immediate practical function is not clear. In view of these circumstances, it may therefore be possible to assume that the Othman qal'a filled two parallel functions: a military fort equipped with artillery and manned by an army, and a prison in which lawbreaking officers and disobedient functionaries were incarcerated, for varying terms. Indeed, Çelebī's silence about the qal'a's integration into the military scheme, and his report [102] of its use as a prison, with a police force commanded by a dīzdār, indicates its real function – which does not necessarily impair its primary conception as a fort par excellence. However, its secondary function, characteristic enough in the histories of other major forts, is reported by at least two other sources and in at least three cases. Once it was in the case of Muḥammad Shiblī ibn al-Ṣamāndjī, who murdered a member of the Amīr Aḥmad's retinue, in the reign of 'Alī Bāshā (1103–1691) [103]; again in the case of Shaykh Aḥmad al-Zarqānī who, as a shāhid in the court of law (in Cairo?), forged a Waqf document and was sentenced by the Wazīr Ismā'īl Bāshā (1108/1696–7) to a list of punishments which also led to deportation to Ṭīna [104]; finally, Ifrandj Aḥmad Bāsh Udāhbāshā (head of the senior Udābāshī officers' cadre and Ḥusayn Udāhbāshā were exiled by their opponents to « Ḥabs al-Ṭīna » (1119/1707) [105] for their rebellious behavior. Hence it would seem that the distant and isolated location of the qal'a, on the desolate Ṭīna plain, scorched by the summer sun and mired by

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100 While this dating is not in doubt (cf. Mubārak, *Khiṭaṭ*, XIII 68; and further), the beginning of its population by the Othmans is still unclear.

101 Evliyā Çalebi, *Seyāḥatnāme*, Istānbūl 1938, X, 749. I am grateful to Prof. J. M. Landau for having translated the two passages, describing Qal'at al-Ṭīna and Ibrīm

102 While Çelebi mentions Ibrīm (*ibid.*, *ibid.*,) it is obvious that he means Ṭīna, in this context; this error, not very surprising (see further), was interpolated here « unintentionally », since Çelebi devotes a special and detailed description to the Ibrīm fort (*ibid.*, 841–844).

103 See *Nuzhat al-Nāẓirīn* (which I have not been able to identify), apud *Mubārak*, *ibid.*, 68.

104 *Nuzhat al-Nāẓirīn*, *ibid.*, *ibid.*,; Djabartī, *'Adjā'ib* (Būlāq) I, 28.

105 Djabartī, Adjā'ib, *ibid.*, 32; with regard to Ifrandj Aḥmad and the circumstances of his exile, see P. M. Holt, *Egypt and the Fertile Crescent* (*1516–1922*), New York 1966, 88–89.

winter marshes, made it a kind of « Devil's Island », whose inmates, according to Çelebī, suffered « the tortures of hell ».

Without risking final conclusions as to the material condition of the military force, whose presence in the qal'a was still documented as late as Dhū al-Ḥidjdja 1140/July 1728 [106], this force was apparently also exposed to the same climatic and logistic problems; Ṭīna was dependent for food and water on Dimyāṭ [107]. To the extent that such was the situation, the functional alertness and morale of the garrison may well be surmised. However, with regard to the billeting of the force in the qal'a, it is at any rate reasonable to assume that the garrison occupied the perimetric octagon, while the internal octagon constituted the prison.

Stage III B

(A) While the annals of the qal'a during the 70 years of 1728–1798 have not as yet been clarified, further change in the function of the qal'a occurred when Napoleon Bonaparte dispatched his expeditionary force to Egypt (July 1798). In preparing for the invasion of Syria–Palestine, Napoleon instructed General Reynier (December 23, 1798) [108] to capture Qaṭya, then abandoned (January 7, 1799) [109] and to build there a fort which should serve strategic and logistic roles simultaneously: block Othman attacks, as well as set up a solid supply base for the French offensive in the Syria–Egypt border region [110]. In order to attain this logistic function, and in view of the organization and communication difficulties posed to an efficient operation of a land supply line (particularly from Bilbīs and Ṣāliḥiyya), a sea supply line was also planned from Dimyāṭ to Qaṭya, via Ṭīna [111]. While its port thereupon served as a debarkation and embarka-

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106 See Na'ūm Shuqair, *Ta'rīkh Sīnā'*, 181.

107 Çelebi, *ibid.*, *ibid.*

108 C. de la Jonqière, *L'Expédition d'Égypte* (*1798–1801*), Paris 1901, III, 471.

109 De la Jonquière, *ibid.*, IV, 46, n. 2.

110 De la Jonquière, *ibid.*, III, 469, 471 ff.; regarding Qaṭya in general and its fort in particular, see the report by Sanson and Sabatier – January 3/7, 1799 – *ibid.*, III, 474 ff.; IV, 46/7, n. 2; 51, 124. Also M. Mangerel, *Le Capitaine Gerbaud* 1773–1799, Paris 1910, 291; Général J. P. Doguereau, *Journal de l'Expédition d'Égypte*, Paris 1904, 121/2.

111 De la Jonquière, *ibid.*, IV, 646–647. Fontaine (*Enquête*, 39) notes that the guard tower of Umm Faradj (see n. 68 above) served as a further station on that supply route. The sailing route of the French vessels – from Dimyāṭ to Ṭīna – was on Manzala Lake; cf. de la Jonquière, *ibid.*, IV, 43; Doguereau, *ibid.*, 143. This testimony indicates, therefore, that the two parts of the lake – the eastern (which Idrīsī calls « *buḥayrat al-zār* » and Abū al-Fidā' calls « *buḥayrat Tinnīs* ») and the western (which Idrīsī calls « *buḥayrat Tinnīs* » and Abū al-Fidā' calls « *buḥayrat Dimyāṭ* ») were still a unified system in the 18th Century; cf. A. R. Guest, « The Delta in the Middle Ages », Journal of the Royal Asiatic Society, 1912, 972.

tion point for the troops [112], the qal'a now became an interim base as a temporary supply depot (especially for rice, oats and biscuit, straw, hay and bran) [113]. Indeed, this project, whereby Ṭīna was to serve as the supply line juncture between Dimyāṭ and Qaṭya, was consummated as soon as Sicard had made a preliminary survey of the area, on January 12, 1799. While promissing that « the vessels designated for dispatching [from Dimyāṭ] to Qaṭya may anchor safely in [the port of] Ṭīna », and that « the supplies may be stored, in case of inclement weather, in the *vieaux fort* located 4,000 toises from the port » [114], Napoleon notified General Dugua, on January 19, that the first transport had already indeed reached Ṭīna [115]; following temporary storage, it was transferred to Qaṭya by a camel caravan [116].

(B) The fact that commodities vulnerable to winter weather were stored in the fort suggests that the building was enclosed and roofed over (at least on its ground floor). The question arising here is whether the qal'a as a fortified enclosure, was assigned a military function along with the logistic. This is not an entirely theoretical question, for in one case, at least, it may have played such a role. A report by General Lagrange, dated January 11, 1799, states that the threat of a « Mamlūk » offensive from the direction of Al-'Arīsh forced him, in the midst of a survey of the Ṭīna-Qaṭya area, to retreat to [Qal'at] Ṭīna [117]. Hence an unequivocal reaction to this matter came from Napoleon himself, in his letter dated January 22, 1799 to General Caffarelli, commander of the Engineers Corps: since the qal'a lacked water, it could not be used as a central military position [118]. However, the plausibility of this statement is questionable in the light of the report by Dr. William Wittman, the British physician attached to the Ottoman army and the English expeditionary force against Napoleon, about the existence of a fresh water (from the Nile!) reservoir inside the qal'a

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112 De la Jonquière, *ibid.*, IV, 122.

113 De la Jonquière, *ibid.*, IV, 48, 112, n. 1; cfr. Fontaine, *ibid.*, 39, 77.

114 De la Jonquière, *ibid.*, IV, 43–45, 44.

115 De la Jonquière, *ibid.*, IV, 112, n. 1; actually, General Lagrange had reported to General Dugua about the safe arrival of the shipment from Dimyāṭ to Ṭīna already on January 17; *ibid.*, 44–45.

116 *Ibid.*, *ibid.*, 124. Regarding its snatch by the Mamlūks of a 60 camel caravan, between Ṭīna and Qaṭya, see Mangerel, *ibid.*, 289; an ordinary caravan apparently consisted of 25–30 camels, cf. De la Jonquière, *ibid.*, IV, 47, note 1. Despite the short distance between Ṭīna and Qaṭya, two days were required, according to General Doguereau's testimony (*ibid.*, 143), for the caravan's going and return.

117 De la Jonquière, *ibid.*, IV, 44.

118 De la Jonquière, *ibid.*, IV, 114.

itself [119]. Indeed, if two and a quarter years later (April 1801) Wittman did find water there, how could one reconcile with it the statement of Napoleon to the contrary? Could this have been a basically Mamlūk reservoir which had been repaired, or merely filled with water, *after* January 22, 1799? Of course, Napoleon's reference may have been to the absence of a source of water in Ṭīna on the spot. For according to Çelebī's testimony [120], water was « always » transported to Ṭīna by vessels from Dimyāṭ; yet it is doubtful that this item alone could have disqualified Ṭīna as a military fort in the full sense of the word. In the final analysis, so long as the sea supply route was not cut off or disrupted, it is reasonable to assume that the qal'a was stocked with water, and could therefore fill a military function in the French stage, as well [121].

Stage III C

(A) After the apparently hasty withdrawal [122] of the French from the Qal'a, it was retaken by an Othman cavalry unit (seemingly sbout mid-April, 1801); this time, however, it continued to function – under extant circumstances – exactly according to the French model, the port as a base for loading and unloading supplies and troops, and the fort as a fortified depot manned by a garrison supplied with artillery [123]. Now, too, the supplies were transported away from it by camel caravans, as well [124]. It is difficult to determine whether this activity continued only up to the summer of 1801 or perhaps even later [125]. At any rate, It is plausible that, with Egypt's recapture in the same year by the Ottomans–British, the qal'a entered a period of gradual decadence, to the point that in the monumental work of the French expedition it is already marked as being in ruins [126]. However, prior to its disintegration Ṭīna III B–C exhibited the structural continuity of the Mamlūk model, as being a connecting link in the system of positions along the Egyptian coast, between Dimyāṭ and Qaṭya. On the other hand, its change of function in the French–Ottoman/British episode

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119 W. Wittman, *Travels in Turkey, Asia Minor, Syria and Across the Desert into Egypt (1799–1801)*, London 1803, 286.

120 See *Seyāḥātnāme*, X, 749.

121 More about this function may be gathered from Napoleon's orders (December 10, 1798) to build a fort at Pelusium (= Ṭīna!); de la Jonquière, *ibid.*, III, 466–468), as well as from the fact that J. M. La Pere reports (DE, XI, 1822, 79) the presence of artillery at Ṭīna already on December 2, 1799.

122 See Wittman, *ibid.*, 284.

123 See Wittman, *ibid.*, 275, 279, 280.

124 *Ibid.*, 286, 293.

125 See Djabartī, 'Adjā'ib (Būlāq), IV, 126–127: s.a. 1226/1811.

126 DE, XVIII/3, 175.

indicates not only its adaptability to the shifting historical circumstances but also the very closing of the shifting historical circle.

(B) What was the plan of Qal'a III? This, in view of its structural continuity from Stage II and the sufficiently clear layout of its remains (see fig. 1 and Pl. I *a, b, c*), should be rhetorical question, i.e., despite the changes in function Qal'a III should be defined as octagonal. Yet, despite this plan, both Çelebi and 'Alī Mubārak – the two contemporary and exclusive authorities in this case define the layout as square (*şekli murabba* [127]; *murabba' al-shakl* [128]). What can account for the seeming discrepancy between the literary evidence and the archaeological finding?

(1) In attempting to explicate Çelebi's testimony, three arguments may be advanced: (a) a scrupulous study of his description arouses doubt as to the degree of his veracity and reliability, i.e., if his topographical delineations are unclear and misleading – in designating Buḥayrat Tinnīs (= Manzala) « Buḥayrat Ṭīna », or Ṭīna's location in the array of the four cardinal directions – should his architectural definition be accepted as exact? Without emphasizing his faulty sense of criticism, if not his textual carelessness, in confusing Qal'at al-Ṭīna with Qal'at Ibrīm (see Note 102), we find enlightening his presentation of the plan of Rūmelī Ḥiṣār [129]; this is to say that, in his detailed description of the capolavoro of the Ottoman art of fortifications (built by Sulṭān Meḥmet II Fātiḥ in 1452 to close off the Bosphorus) [130], Çelebi delves more into symbolic – even mythic [131] – interpretation of the architectural plan, rather than a ground plan which truly follows the topographical contours. In other words, Çelebī described what he saw in his mind's eye, as well as what his eyes beheld. In view of such treatment of the subject, it behooves us to regard with reservation what he has to say about the square form of Qal'at al-Ṭīna and about its forty rooms and mosque, which he ascribed to Selīm Khān [132].

(2) The second argument is based on two primary facts and the conclusion they suggest: since, on the one hand, the present layout is octagonal, while, on the other, Çelebī's report relates to the 1680's, then the date of the octagonal structure must be set later than 1672–80. This leads to a simple

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127 See Çelebi, *ibid.*, 749.

128 Mubārak, *Khiṭaṭ*, XIII, 68.

129 J. von Hammer, *Narrative of the Travels in Europe, Asia and Africa in the Seventeenth Century by Evliyā Efendi*, 1/2, London 1846, 66–68.

130 A. Gabriel, *Châteaux Turcs du Bosphore*, Paris 1943, 29 ff. and below.

131 According to Çelebi's imaginative vision (Von Hammer, *ibid.*, 67), the layout was designed – not without Christian influence! – in the form of the word « Muḥammad ».

132 *Seyāḥatnāme*, X, 749.

question: Did the Othmans indeed built in Ṭīna a monumental octagonal structure, whose military motive – or function – is unclear, to say the least, while its use as a prison is beyond doubt? Now, in attempting to answer this question, we must remember that not only did the Mamlūk fort fall to the Othmans without a struggle, but also that, in the history of Othmanic military architecture, we have not found to date any fort [133] built in octagonal form, originally, to say nothing of an octagonal prison. To the extent that the Othmans did incorporate polygonal formations in their fortifications, these were to be found not in compact and complete layouts (as in Ṭīna) but rather in individual towers and donjons that were integral parts of major layouts (such as donjon B in Rūmelī-Ḥiṣār, whose dodecagonal [134] plan was certainly influenced – at least for the exterior – by the octagonal « Red Tower » which the Seldjuqs built in Alania in 1226 [135], or the octagonal tower J, built in the 18th century, apparently on the foundations of a Byzantine tower, plus the dodecagonal tower B which Meḥmet II built in 1457/8 in Yidīkūle Ḥiṣār in Istānbūl) [136]. Consequently, if the octagonal plan did not figure in the metropolitan Othmanic fortresses, it is highly questionable that the Othmans should have done it precisely in Ṭīna, which is not even listed among the fiscal and organizational items in their network of fortifications in Egypt [137]. Admittedly, the absence of such a fort in the Ottoman context and its rarity, moreover, in the broad context of fortificational architecture (see further), are likely to negate any Ottoman role in the octagonal construction of Qal'at al-Ṭīna III.

(C) 1) Indeed, the rarity – if not the exclusivity – of the octagonal plan may explain the « square » designation by Çelebī. For the fact that, in the course of his extensive tours of the Empire, he became aware of the square fortifications, even though not regularly, caused the square to become standard, as indeed it was at times. Thus, his subconsciousness may have led him (being unfamiliar with the octagonal form, to view Qal'at al-Ṭīna, as well, as being square. This is not mere theory, if we consider

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[133] The apparently analogous fort Castel Da Mare at Modon (Peloponnese) should be regarded as a Venetian construction restored by the Ottomans, after its being partially demolished by their artillery in 1500; for the details see sh. Tamari, « *To the dating of the octagonal fortress at Modon* », Bar Ilan University Yearbook XIV–XV (1977) 133–138; Idem., « *The Venetian-Ottoman fort Castel Da Mare at Modon* », Castellum XX, 1978. (in print).

[134] See A. Gabriel, *ibid.*, 39, 46–47, 49.

[135] Cf. Seton Loyd–D. S. Rice, *Alanya* (*'Alā'iyya*), London 1958, 11–16.

[136] Cf. A. Gabriel, *ibid.*, 85 ff., 97, 98, 100.

[137] S. J. Shaw, *The Financial and Administrative Organisation and Development of Ottoman Egypt* (*1517–1798*), Princeton 1962, 198, 211, 394.

the transformation in Stage III, in which the facade of the gate (which he identified) [138] was extended in such a way that the partial « straightening out » of the octagon may have given him a visual conception of reality. Indeed, the comingling of this visual reality with his prejudiced conception of the square plan of the qal'a, in all likelihood induced this optical illusion.

2) As for 'Alī Mubārak's statement about Qal'at al-Ṭīna, in analyzing it we must address ourselves to its three main components, as follows: a') *wa-bihā tall 'āl* b') *fīhi sūr murabba' al-shakl* c') *wa-bidjihatihi al-baḥriyya bāb yuftaḥ 'alā al-baḥr* [139]. With regard to components a' and c', there can apparently be no difference of opinion: there is no « high mound » in Qal'at al-Ṭīna, and locating its gate facing the sea, to the north, is contrary not only to archaeological finds and even to Çelebī's own testimony but also to any elementary military logic (in all cases of coastal fortifications with functions similar to those of Qal'at al-Ṭīna, their one and only gate, as will be seen further, faces in the direction away from the sea!). Hence, how are we to reconcile these seemingly contradictory facts? This may be achieved through 'Alī Mubārak's next statement, He says: « *Wa-biqurb hādhā al-tall tall ākhar tusammīhi al-'Arab al-Qaṣr wa-la'allahu kāna huwa maḥall al-qal'a al-qadīma wa-djamī' hādhā al-āthār tu'raf bayna al-nās bitall al-'Amārna wal-Faramā* [140]. In determining that « in the vicinity of this mound there is another mound, called by the Beduins « al-Qaṣr », 'Alī Mubārak thereby unwittingly gives us the answer to the question: the same mound = « al-Qaṣr » which, according to Mubārak himself, « may have been the site of the ancient [Roman] fort », is but the rectangular fortified enclosure, 200 × 400 meters, which Clédat [141] identified as the seat of the Equites Stablesiani in the western section of Tell Faramā (= Pelusium; see pl. XV). In other words, as soon as it became clear that Mubārak was referring to Qaṣr = Tell al-Faramā (obviously not Tell 'Amārna), then the only mound located in the vicinity was Tell Maḥzan. And indeed, this square tell, at present some 1,100 meters east of the « Qaṣr – in al-Faramā (but which is actually an organic part of its entire complex; see pl. XV), its summit, 10 meters + was formed by a

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138 *Seyāḥatnāme, ibid.*, 749.

139 *Khiṭaṭ*, XIII, 68.

140 *Khiṭaṭ, ibid., ibid.*

141 J. Clédat, *Le Temple de Zeus Cassios a Péluse*, ASAE XIII, 1914, 79–81. The distance, as the arrow flies, from the northeastern corner of « al-Qaṣr » to Qal'at al-Ṭīna is about 3,000 meters (see Pl. XV and aerial photographs). Also Fontaine, *Monographie Cartographique*, 140.

square wall (100 × 100 meters) [142]. Without regard for the dating of this unexcavated fort – whether it was Roman, as Clédat [143] believed or « Arabic », according to Griffith [144], this was most probably the subject to which Mubārak's first two components referred: *tall 'āl* = more than ten meters; *fīhi sūr murabba' al-shakl* = walls of 100 × 100 meters. Hence, whether 'Alī Mubārak drew his information about Qal'at al-Ṭīna from extant literature, mechanically copying Ibn Taghrībirdī's statement about Burdj I (of Barsbāy), or had determined its location on the basis of his own survey of the area, having been attracted – naturally, perhaps – to the antiquities of al-Faramā-Pelusium, his report about the qal'a's plan is apparently erroneous. Such a statement might therefore conclude the nature of the discrepancy between the literary testimony and the archaeological findings. If, nevertheless, we refrain in the meantime from reaching a final conclusion, it is not only because the texts of Çelebī and Mubārak remain actually as they were (despite their known limitations in other contexts, as well) but also, and primarily, because we have no positive literary documentation [145] and, particularly, no systematic archaeological excavation. Until these are not available, we may therefore assume the existence of another possibility, difficult though it may be – the qul'a III plan as consisting of an internal octagon, surrounded by a square wall [146].

TYPOLOGY: BURDJ I

(A) The growth and evolution of the coastal towers in the Middle Ages was in the main an outcome of the same universal and multi-secular phenomenon – piracy. The daring, brutal and often deep piratical raids – Christians or Muslims, on several of the vulnerable and isolated coasts of the Mediterranean lands – were motivated, as it is known, not only by their thirst for water and desire for plunder but also, and primarily, to capture slaves and trade with them [147]. In view of this situation, it is

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142 Clédat, *ibid.*, 79.

143 Clédat, *ibid.*, *ibid.*; (this statement seems to be the most plausible).

144 F. Griffith apud W. M. Flinders-Petrie, Tanis II; EEF IV, London 1888, 99.

145 In this context it should also be noted that Qal'at al-Ṭīna's delineation in DE, *État Moderne I*, 1822, Pl. 10 is of a square layout.

146 Without having to go here into an analysis of such a hypothesis, it may be that the external complex was rebuilt by the Othmans in a square layout (about 500 perimeter paces (?!), according to Çelebi (*ibid.*, 749); if this is the case, then Qal'a III may be viewed as being analogous to the Abū-Qīr fort (1527-8), for which see Çelebi (*ibid.*, 700-701), where he describes it as being circular (!), and DE, *ibid.*, 83 : 2, 90 : 10.

147 Cf. Ph. Gosse, *The History of Piracy*, 70 ff. (« The trade in slaves was the reason, the support, the reward of the Mediterranean pirate, both classical and Barbary, for upward

not surprising that the adequate positioning of the warning, alarms, defense and shelter systems and the effective disposition of this network along those coasts (not populated by fortified cities) were a direct function of the same problems and the same solutions. Indeed, the uniform and unchanging nature of the piratical guerilla warfare, under similar environmental conditions, is reason for the fixed characteristics – in times and places so far apart – of the same uniform strategic solution: on the one hand, the erection of the detached and separate tower (though not always isolated) – often called « saraceno » in the west and, on the other hand, the « Martello Tower » [148]. Indeed, their architectural components are generally uniform and fixed [149].

(B) 1) Regarding the Saraceno tower, its plan is right–angled or even circular, with two or three floors (at times the ground floor is but a massive, filled–in foundation); its single opening – located away from the sea – is raised above ground level; the entrance thereto (at times across a moat is via ramp/bridge or ladder/stairway (fixed or movable); window apertures are set into its external walls – except in the wall facing the sea – along the upper level; inside, its one or two–sapce floors contain, in addition to a fortified cellar and a water reservoir (at times found outside) also service rooms (storeroom, kitchen) and quarters for the garrison [150]. Although in many cases this tower played no real defensive role because of, among others, its tactical limitations, nevertheless its utilitarian and economical construction allowed little of the decorative. The emphasis was thus on the structural features: thick, sharply inclined walls; apertured battlements around the roof, generally commanding the area; a machicoulis on a high level above the single opening. 2) The attempt to determine the topology of Burdj I in Ṭīna will be done in the framework of its possible affinity to this same « tower », spread and located at selected points along the Mediterranean coasts, from the Algerian coast in North Africa, via the Ionian coast of Sicily and up to the Adriatic and the Mediterranean coasts of southern Italy, Cyprus and Syria. Moreover, this arbitrary order of the analysis may also provide a key for determining some kind of

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of 20 centuries). See also V. Faglia, *La Difesa Contro i Predoni Marittimi*, BISCAG, XLI/1, 1975, 83 ff.

148 A bibliographical list of the coastal towers (mainly the Italians) is in V. Faglia's « Contributo alla Conoscenza delle Torri Costiere in Terra di Bari », *Castellum* 10, 1969, 69, n. 2, 70 n. 3; Idem, *La difesa...*, BISCAG, XLI/1, 1975, 92 ff.

149 Cf. A. Cassi Ramelli, *Dalle Caverne ai Rifugi Blindati*, Milano 1964, 298; G. Agnello, « Le Torri Costiere di Siracusa nella Lotta Anticorsara », ASS IX, 1963, 24–5.

150 Regarding the size and operational methods of the garrison in the coastal towers of southern Italy in the 16th Century, see Cassi Ramelli, *ibid.*, 302.

genetic and chronological schema of the « coastal tower » in the Middle Ages.

a) In the context of the systematic policy of the Marinid Sulṭān 'Alī Abū al-Ḥasan (d. 1351) to provide the western coast of the Maghrib with effective protection, a system of fortified enclosures and guard towers was set up, in a project extending from Asfī to Ǧaza'ir Banī Mazġannān [151] (Algeria). In this system of location, situated either in accordance with specific topographical considerations or as renovations of previous fortified layouts (Muslim or Punic-Roman), G. Vuillemot located and surveyed 17 localities along the coast of western Oran [152]; of these, about nine served, at one time or another, particularly as trading towns with a civilian population, while at least four [153] are distinguished by exclusively military functions. Their functional designation, as defensive guard towers (although at times used as lighthouses), therefore determined the uniformity of their structural plan: a square enclosure [154], built massively en pisée, in considerable thickness (in some instances surrounded by living quarters and/or other services) – Table A:

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[151] See Ibn Marzūq, *Musnad* (E. Levi-Provençal, *Hesperis* V, 1925, 22–23) chapter 39, 61–62: « *Fī Inshā'ihi al-maḥāris wal-manāẓir fī djami' bilād al-sawāḥil wa-hiya mawāḍi' al-Ribāt* »; despite Levi-Provençal's comments on these terms, it seems that the complex institution of the Ribāṭ still requires a comprehensive and basic typological study. In the herein context, it is enough to have Zbiss' definition of the North African Ribāṭ, as a defensive naval fortification, originally intended to protect the coast againts Christian naval incursions; see S. M. Zbiss, « Le Ribat, Institution Militaro-Religieuse de Cotes Nord-Africaines », BIICH VI, 1954, 144. For the flexible definition of *Ribat-maḥras*, see also L. Golvin, « Note sur le Mot ' Ribat ' (terme d'architecture) et son interprétation en Occident Musulman », *Revue de l'Occident Musulman et de la Méditérranée*, VI, 1969, 95–101.

[152] G. Vuillemot, « Ruines Musulmanes sur le Littoral de l'Oranie Occidentale », *Revue Africaine* CIII/1–2, 1959, 27–54.

[153] Remains of other towers, connected with more complicated complexes, are found at Presqu'île Lindles (*ibid.*, 33–34), Mersa Ouardaniya (*ibid.*, 43–44), Tabaurit (*ibid.*, 47). Regarding coastal watchtowers, which, in the 13th Century, also served as lighthouses on the French coast of the Mediterranean, see Viollet Le Duc, *Dictionaire Raisonné de l'Architecture Français*, Paris 1870, IX, 184.

[154] In this context mention should be made of the preference for the square tower, also in the shore facade of the Ribāṭ (as in Tīṭ on the Moroccoan coast/12th Century; for this see H. Basset-H. Terrase, « Sanctuaires et Fortresses Almohades », *Hesperis* VII, 1927, 117 ff., 125 + n. 1. Also of interest is the layout (circular at its base and octagonal in its upper part) of Bordj de la Mer (*ibid.*, 129), and cf. the group of Rābiṭa structures, built in the 11th Century and subsequently along the Atlantic coast of Muslim Spain: L. Torres Bàlbas, « Rabitas Hispanomusulmanas », *Al-Andalus* XIII, 1948, 476 ff., 481.

Table A

Name of Locality	Period	Layout	Literature
Cap Falcon–Dār al-Sulṭān	« Medieval »	5 × 5 m.	Vuillemot, *ibid.*, 29–30 + fig. 1
Tour Maure	« Medieval »	5 × 5 m.	*Ibid.*, 40–41
Honain	« Medieval »	5 × 5 m.	*Ibid.*, 45; G. Marçais, Rev. Afr. LXIX, 1928, 350
Taount	« Medieval »	5 × 5 m.	Vuillemot, *ibid.*, 45–46; F. Llabador, Rev. Afr., 1944, 199

B') The erection of most of the Italian coastal towers should be dated in the second half of the 16th century (particularly after the Ottoman conquest of Rhodes in 1522) [155]. The Christian naval armada, on a punitive expedition to North African Tripoli, suffered an unprecedented debacle on May 10, 1560, when it was surprised by the Algerian archpirate Dragut [156], who had already swept the coasts of Italy, France and Spain; now that the routes were open, he was joined by Lucciali in raiding the Ligurian coast. This defeat, and the fresh danger it meant, spurred the authorities to a swift and urgent erection of coastal guard towers. Indeed, it was Pope Pius IV, concerned as he was about the pilgrim ships (to Rome) from Sicily, France and Spain, who first ordered the local nobility to build an organic network of 56 towers, from Garigliano to Fiore, in the Spiaggia Romana [157]. A similar network was erected on the Mezzogiorno coast, on orders by the King of Naples [158] and with the active aid of the Riverseque nobility; by 1590 the network consisted of 339 towers, positioned as follws: 13 in Abruzzo; 25 in Capitanata; 20 in Terra di Bari; [159] 80 in Terra

155 Generally see V. Faglia, « La Difesa anticorsara in Italia dal XVI secolo », BISCAG, XLI/1 1975, 79 ff.

156 For which see Gosse, *ibid.*, 18 ff.

157 For these towers, built (mostly) or restored (a few) in the 16th Century and later, often square-shaped, see G. M. de Rossi, *Torri Costiere del Lazio*, Roma 1971, nos. 1/2/4/5/7/8/11/12/14/20/22/24/27/30–32/37–39/41–45/54/57/59; cf. also V. Faglia, BISCAG XLI/1, 1975, 103 ff.

158 Cf. O. Pasanisi, « La Costruzione Generale delle Torri Marittime Ordinate dalla R. Corte di Napoli nel sec. XVI », *Studi di Storia Napoletana in Onore di M. Schipa*, Napoli 1926, 423–442.

159 Along the coastal strip – about 150 kilometers – of Terra di Bari there are actually 14 towers; cf. V. Faglia, *Contributo*, 72 ff.

d'Otranto; 13 in Basilicata; 36 in Calabria Citra and 60 in Calabria Ultra [160]. To these there should be added the towers of Sicilian Siracusa [161]. Hence, in these towers, as well, the functional identicalness led to a uniform architectural plan [162]: other than the round form, which is of no concern for our discussion (and whose frequency is, at any rate, quite low), the solid layout of these towers was generally rectangular (as in Siracusa) or square (as in Terra di Bari), with two or three floors, protected by steeply vertical walls (some with window apertures set into them) and a drawbridge. Their single ingress – in the wall facing away from the sea – led to living and service quarters (these were in some cases added on in the tower courtyard); the roof, commanding the area and perimetered with an apertured battlement, contained a battery and sentry (torrai). The following are examples of Italian coastal towers: Siracusa (Table B) and Terra di Bari (Table C):

Table B

Name and Locality	Period	Plan	Floors	Literature
Torre di Milocca, isolated on wide plain 2 km. away from the sea and Siracusa port	1462; 1467; present appearance dates to 1697	9.32 × 11.40 m.	3; 14.25 m. high	G. Agnello, ASS IX, 1963, 29 ff.
Torre Landolina, 4 km. from the port	Rebuilt at unknown date after 1693 earthquake	6.55 × 6.55 m.	3; 13.45 m. high	*Ibid.*, 44 ff.
Torre di Pozzallo	Early 15th Century	19.50 × 19.30 m.	3; 30 m. high	G. Agnello, ASS X, 1964, 40 ff.

160 Cf. Cassi Ramelli, *ibid.*, 300–302.

161 For two other Sicilian examples – in Palermo and Messina – see Agnello, *ibid.*, 29 ff. and further; also A. Drago Beltrandi, *Castelli di Sicilia*, Milano 1956, Tavv. 97–98.

162 Cf. L. Santoro, « Le Torri Costiere della Campania », *Napoli Nobilissima*, 1967 (Gen.–Aprile), 43. For the same layout of the coastal towers in Crete, see G. Gerola, *Monumenti Veneti nell'Isola di Creta* I/1, Venezia 1905, 294–297.

Table C

Name and Locality	Period	Plan	Floors	Literature
Torre d'Ofanto, isolated 1 km. away from the sea	16th Century (1569)	10 × 10 m.	One floor, on a conical – pyramidal blocked up foundation floor	V. Faglia, Castellum X, 1969, 78–79
Torre Lama Paternò, isolated, 10 m. from the sea	"	"	"	*Ibid.*, 79–80
Torre Calderina, on the shore	"	"	"	*Ibid.*, 81
Torre di S. Spirito, near the port	"	"	"	*Ibid.*, 82
Torre di S. Vito, isolated on the shore	"	"	"	*Ibid.*, 86
Torre Incina, isolated, 100 m. from the sea	"	"	"	*Ibid.*, 87–88
Torre Ripagnola, isolated on the shore	16th Century (1573)	"	"	*Ibid.*, 85

C') The peculiar geo–strategic situation of Lusignian Cyprus (12th–15th Centuries), as an island vulnerable to incursions, uprisings and recurrent raids, were the characteristic determinants of its defense system. According to G. Rey [163], this military system consisted of three architectural components: fortified maritime cities, coastal lookout posts, mountain shelter fortresses. The fortresses were classified by C. Enlart [164] into three types: mountain fortresses whose irregular and variable layouts were determined by the topographical configuration (such as St. Hilarion, Cantara and Bufavento); plain fortresses, whoses regular form was set by rectangu-

[163] *Étude sur les Monuments de l'Architecture Militaire des Croisés en Syrie et dans l'Ile de Chypre*, Paris 1871, 229. In a fresh attempt to set the « environmental » typology, G. Pierbellini divided the defensive system of Cyprus into three main groupings: the northern system (consisting particularly of the mountain forts); the eastern and southeastern system (consisting of at least three sub–systems: Gastria and Famagusta; Pyla, Larnaca, Kiti, Alamino, and others); a central system (Nicosia, Siguri, and others); see G. Pierbellini, « Le Fortificazioni di Cipro dal x al xvi secolo », *Castellum* 17/1, 1973, 7–58.

[164] *L'Art Gothique et la Renaissance en Chypre*, Paris 1899, II, 501.

lar and corner towers (such as Cherine, Famagusta and Siguri); simple towers, either isolated or with secondary structures attached (such as Kolossi, Kiti, Alamino and Akamas).

In order to protect the open approaches to the Cyprian coast, a system of warning and lookout towers was erected along its entire (!) length (apparently already by Jacques I after 1382 [165] – certainly in the 15th Century) [166]. Of this network of coastal towers (at times called *donjons* by Enlart and Pierbellini), most of which were destroyed in the 19th Century [167], only a few remained, at the tips of the capes on the southeastern coast, in Larnaca Bay – Cape Pyla, Cape Kiti and Lefkara (Pyrgos), and perhaps also the tower on the present site of the Turkish fortress in Larnaca (the land towers in Pyla and Alamino apparently served as fortified shelters against pirates); in Akrotiri Bay – Kolossi; on the western coast – Cape Akamas and Guardia (near Inya). Indeed, these rectangular or square towers, two or three floors high and located one mile apart (according to Stephano Lusigniano), were manned by « military police » (the Francomati in the days of Jacques the Bastard and the Albanian mercenaries under the Venetians) [168]. Their characteristics may be summarized as in Table D:

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165 G. Jeffery, *Cyprus Monuments: Historical and Architectural Buildings*, No, 6, Nicosia 1935, 13 ff.

166 Rey's dating (*ibid.*, 230) « most of them » in the 14th Century has already been rebutted by Elnart (see Table D below). On the other hand, according to the testimony of S. Lusigniano (*Chorograffia*, 1573) this system was continued also by the Venetians; Jeffery, *ibid.*, 13.

167 Cf. Jeffery, *ibid.*, 16.

168 Enlart, *ibid.*, 671; Jeffery, *ibid.*, 14.

Table D

Name and Location	Period	Plan	Floors	Literature
Kolossi (le Colos) 10 km. west of Limasol on the way to Paphos; an « hour » away from the sea; commands Akrotiri coasts	Founded : 14th C. on Byzantine base (?); destroyed by Genoese, 1373 1402; by Mamlūks 1413, 1425–6; rebuilt 1454	21 × 21 m.	3 (2+ foundation; 29 m. high; 1st fl. entrance over drawbridge	G. Rey. *ibid.*, 233–237+fig. 58; C. Enlart, *ibid.*, 683–691 + fig. 402; R. Gunnis, *Historic Cyprus*, 236–239; E. Jeffery, « Cyprus Monuments », HAM V, Nicosia 1933, 1 ff. 10, 11 ff.; Pierbellini, *ibid.*, 46, fig. 30, 47–8.
Pyla, NE of Larnaca	« très basse époque » 14th–15th C.	7.20 × 3.32 m.	3, entrance on 1st floor	C. Enlart, *ibid.*, 666–667 + fig. 394; R. Gunnis, *ibid.*, 407; Pierbellini, *ibid.*, 33, 36.
Pyla, between the cape and the village	Venetian	Circular	2	R. Gunnis, *ibid.*, 465.
Cape Kiti, by the sea between Larnaca and Nicosia (?) near ancient Kition	1196: property of Archbischop of Cyprus; 1426: Mamlūk attack; 1469: property of Henri de Lusignian; end of 15th or early 16th C.: Venetian present structure 2nd half 15th C.	Rectangular	2, ent. 1st floor	G. Rey, *ibid.*, 231–232 + fig. 57; C. Enlart, *ibid.*, 667–669 + fig. 396; Pierbellini, *ibid.*, 33, fig. 16; 36. n. 29.
Alaminno	Probably 15th C.	Rectangular	3 (2+ foundation. 1st floor Entrance	C. Enlart, *ibid.*, 669–670+fig. 397; R. Gunnis, *ibid.*, 160; Pierbellini *ibid.*, 32, fig. 14, 36. n. 29
Cape Akamas, between Polis and Paphos		Rectangular	2	C. Enlart, *ibid.*, 670

(d) Henceforth, in the effort to determine, on the limited basis of the cited material, the typology of Ṭīna's Burdj I, we may arrive at one conclusion and make another assumption. While its function, location and plan follow, in the main, the basic characteristics of the Mediterranean coastal tower, its distinct Islamic delineation cannot for the present emerge heyond the confines of a « working hypothesis »; this being but the consequence of the present state of the study of the « coastal tower »; not only do we still lack an historical–architectural synthesis of the tower in the Islamica context, but even in its broader Mediterranean context the study has been focused on merely local types (regional, at most) rather than on the universal expanse [169]. In other words, despite its functional and morphological identicalness in principle, the exact temporal and spatial processes of its disposition have not as yet been clarified. In such a situation, any effort to sketch out a genetic and chronological schema must be regarded as exceedingly flexible and tentative.

The concrete issue to be clarified is therefore the extent to which the Mamlūk work represents a local development. In other words, is Barsbāy's work on the Ṭīna Burdj rooted in the tradition of the military Musilm rather than « European » architecture? Despite the bilateral relationship between the Mamlūk state and the ' Frankish ' legacy, in its Italian or Cyprian manifestation, it appears that we shall have to give preference – even though with cautious generalization – to the first possibility. This preference for the Islamic is based on two facts: firstly, the existence of Muslim coastal towers in the Maghrib, at least as of the 11th Century; secondly, the emergence – not before the 12th Century – of the earliest « Italian » tower (at times called the Genoese) on the Black Sea coasts, particularly in the district of Alexandretta Bay in Syria [170]; Is it therefore not reasonable that the Genoese type should have drawn, in its formative process, on the Muslim model, whose existence, albeit in other manifestations and contexts, is documented already before the 11th Century even in the Province of Messina [171]? Is it, morevoer, merely a coincidence that the « coastal tower »

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[169] For the *torri costiere negli studi più recenti* see comments by V. Faglia in BISCAG XLI/1, 1975, 95 ff.

[170] Regarding the Torri Costiere Genovesi, especially the two near the port of Anamur (between Adalia Bay and Alexandretta) and Gebal, see L. A. Maggiorotti, *Architetti e Architetture Militari*, Roma n.d. 59–61 + fig. 41. [Regarding the Genoese Republic towers, see summary by V. Faglia, BISCAG XLI/1, 1975, 100 ff.]. Regarding the Giblet fort, whose early segments are probably from the 12th Century, see W. Müller–Wiener, *Burgen der Kreuzritter*, 65–66 + pls. 85–87.

[171] Cf. D. Ryolo, Sopravvivenze Arabe in Provincia di Messina, *Palladio* XVIII 1968, 31 ff. Regarding the nature of the Muslim occupation of Italian territory (especially the ties between the Emirate of Bari and the Baghdad caliphate in the middle of the 9th Cen-

is often connected in the Italian lexicon with the adjective (indicating a noun) *saraceno* [172]? Of course, if the available material would be sufficient to confirm this statement, we might arrive at another conclusion, namely, that not only was the later (16th and 17th Century) Italian tower itself an outgrowth of the Genoese–Muslim (despite the structural alterations in its construction after the introduction of artillery thereinto), but also that the pre–Venetian Cyprian examples were not necessarily a French application [173] but had been developed as further instance in the same genetic schema (whether by direct transfer from Crusader Syria–Palestine [174], or – in other terms – by an indirect extension of the Genoese–Crusader–Muslim type).

Without arriving here at a set conclusion on this subject, it may yet be derived – to one degree or another – that the emanation of the medieval Muslim type from the Roman–Byzantine and or from the Sassanid heritage, may have broght forward a kind of « prototype » (although not a « perfect model ») which, in passing through the Byzantine–Muslim representation in North Africa and Spain [175], reached Europe [176] and thence returned (if at all) to the Muslim East, in the later Middle Ages. Either way, one evident fact is associated with the Burdj which Barsbāy built in Ṭīna in 1425: while embodying the most elementary plan of a fortified structure [177],

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tury, see F. Gabrieli, « Gli Arabi in Spagna e in Italia », *Ordinamenti Militari in Occidente nell'Alto Medioevo* (Settimane di Studio del Centro Italiano di Studi sull'Alto Medioevo XV, 1968, II, 714–715.

172 Cf. for example Ramelli, *ibid.*, 298.

173 Regarding the « French » thesis, see Enlart, *ibid.*, 502–503, 706: in the light of the above, one may ask whether it is indeed true (at least in the herein context) that the Cyprian Gothic was brought to southern Italy after the campaign of Frederic II to Cyprus and the migration of its craftsmen to Italy (1232); and see below.

174 Cf. Rey, *ibid.*, 230; Jeffery, (*ibid.*, nos. 5, 16) notes the existence of several Crusader towers, similar to the one at Kolossi. For the example of Tour Bichat, built in Paris in the 12th Century and which actually belongs to the same type of tower which the Templars built in Syria, see Viollet Le Duc, *Dictionnaire Raisonné de l'Architecture Français*, Paris 1870, IX, 163–164. Actually, the fact that Kolossi served simultaneously as the Hospitaler residence and an anti–piratic haven gave it special – if not extraordinary status, in this Cyprian framework; see Jeffery, *ibid.*, 17; J. Richard, *Chypre sous les Lusignans*, Paris 1962, 68.

175 Cf. L. Villena, « Development of Castels and Historic Houses 5: Spain », BIICH XVII, 1962, 6.

176 Cf. L. Villena, « Evolution of Fotification and Poliorcetic », BIICH, XIX, 1964, 49–50.

177 Cf. A. Châtelain, *Architecture Militaire Médiévale*, Paris 1970, 7. In this connection, no emphasis was placed on the symbolic aspect of the tower, as Viollet Le Duc (*ibid.*, 189) had summarized and defined it: « La Tour devient ainsi, en même temps qu'une sûrete, un moyen de surveillance at une marque honorifique ». This aspect will be further emphasized in its connection with the qal'a.

set forth by Rocchi [178] as « primo e finale compendio della fortificazione isolata », it does antedate all the European examples above discussed.

QAL'A III: ANALYSIS OF THE ARCHITECTURAL DESIGN *

The octagonal structure of the qal'a poses two main problems:

1) the relationship between the perimetric and internal structures;
2) the possibility of there having been several construction stages, of the entire structure or of some of its parts.

The architectural analysis will be presented as follows:

(a) the architectural composition
(b) the modular aspect
(c) the metrological system
(d) partial reconstruction of the plan, to the extent possible.

Analysis of the Architectural Composition

As the basic unit of the architectural composition, we have selected the internal court of the central octagon. The width of the court (D_1C_1 = 8.30 m.) [179], in its comparison with the widths of the two rings of rooms surrounding it (21.95 m. = G'H'; 13.45 m. = C'D') provides approximately the proportion of the golden section ø = 1,618 [180], since

$$\frac{H'G'}{D'C'} = \frac{21.95}{13.45} = 1{,}624 \text{ and } \frac{D_1C_1}{D'C'} = \frac{13.45}{8.30} = 1{,}608$$

(See Table 1 below and figs. 2, 3).

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* Preparation of this chapter was aided by Arch. Chen.

178 Apud A. Cassi Ramelli, *ibid.*, 281.

179 Measurement of the structure was done with the aid of a metal meter-tape. Two separate triangular nets were spread over the area, and the results obtained were again checked by direct measurement along the axes.

180 R. Wittkower, *Architectural Principles in the Age of Humanism*, 1967, (Appendix III); G. П. Михаипов, *Вимрусиу и аллада*, Москва, 1967; R. H. Scholfield, *The Theoyr of Proportion in Architecture*, Cambridge, 1953; W. von Wersin, *Das Buch vom Rechteck*, Ravensburg 1956; M. Zlocović, *Uloga neprekidne podele ili ' zlatnog preseka ' u architektonskoj kompeziciji deo I, II, III, Pregled Architekture*, 1, 2, 3, Beograd.

Table I – *Dimensions of the Structure*

Square	Base of Square	Σm	G'K'	fG'	G'f	C_1C'	D_1C_1	$D'D_1$	hD'	H'h	L'H'
ABCD	D_1C_1	8.30					8.30				
EFGH	D'C'	13.45				2.60	8.30	2.55			
JKL	H'G'	21.95		1.35	2.90	2.60	8.30	2.55	2.90	1.35	
MNOP	L'K'	35.45	(6.75)	1.35	2.90	2.60	8.30	2.55	2.90	1.35	6.75

m = meter

This fact helps strengthen the conclusion that the entire central structure is planned on the basis of progressive and harmonious enlargement of the squares, their bases being D_1C_1, C'D', G'H'.

If we add, to line G'H', the width of the corridor, between the central and perimetric octagons (6.75), we shall come up again with approximately the same proportion (1,618), since

$$\frac{L'K'}{H'G'} = \frac{35.45}{21.95} = 1.617$$

The mathematical examination is based on the multiplication of the width figure of the central court, line D_1C_1, by the progressive values of the harmonic series of the golden section [181]:

1.618, 2.618, 4.234 i.e., 1, ø. $ø^2$, $ø^3$ ...$ø^n$. This examination is set forth in Table II, as follows:

Table II – *Dimensions of Harmonious Squares*

Square	Basis of Square	Σ m	$8.30ø^n$	8.30^n m	$\Sigma \frac{1}{m}$	Difference m	Difference %
ABCD	D_1C_1	8.30	$8.30ø^0$	8.30	8.30	–	
EFGH	D'C'	13.45	8.30ø	8.30 × 1.618	13.42	+ 0.03	
IJKL	H'G'	21.95	$8.30ø^2$	8.30 × 2.618	21.72	+ 0.27	2% >
MNOP	L'K'	35.45	$8.30ø^3$	8.30 × 4.234	35.14	+ 0.31	1% >

m = meter

These results indicate that the internal and the perimetric octagonal structures were planned as a single entity. The Table shows that, by comparing the results of the measurements of the harmonious bases of squares

181 Zloković, *op. cit.*, I, 14; Scholfield, *op. cit.*, 129 ff.

ABCD, EFGH, IJKL and MNOP with the multiplication of the internal court width (D'C' = 8.30 m.) by the numerical values of the harmonious series of the golden section, we shall always obtain differences smaller than 2% [182], and these are negligible. An explanation of these differences is given further, in the metrological analysis.

The graphic examination is based on a harmonious enlargement of the quare ABCD, as set forth in Fig. A [183].

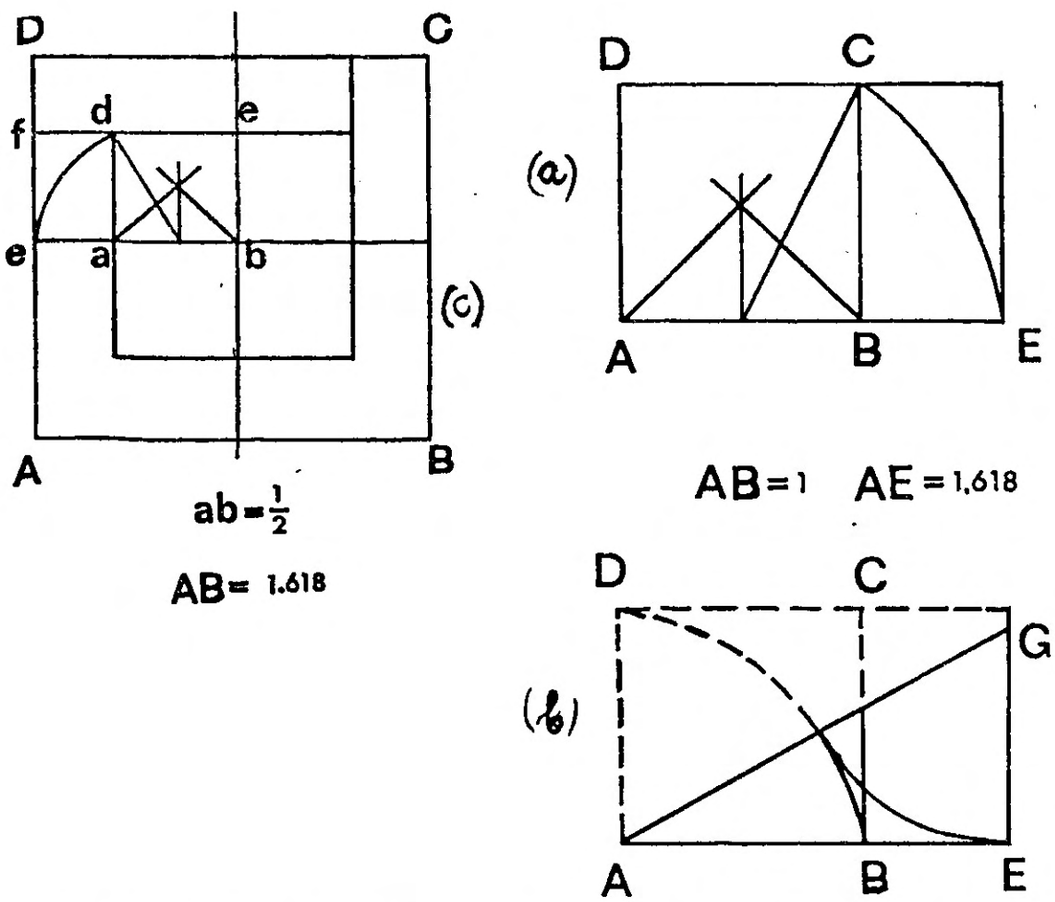

Fig. A: *Division and Enlargement of Square by the Golden Section*

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182 It is a known phenomenon that there is a difference between those measurements taken on the premises and those obtained from calculation. There are several reasons for it: inaccuracies in measuring the remains of the edifice, inaccuracies in the performance of the work, wrong graphic method used in the planning or in rounding out the harmonic relationships by modular planning. At any rate, any error beyond 2% is regarded as substantial. For example, in examining 42 churches of the 4th to the 6th Centuries, it was found that there was error of up to 1% in 80% of the measurements, up to 2% in 15%, above 2% in 4%, and 4% only in 1%; see N. Spremo-Petrović, *Proportions Architecturales dans les Plans des Basiliques de la Prefecture de l'Illyricum*, Beograde, 1971; in a study of modular properties of 17 insulae in Roman Emona, it was found that there were differences of up to 1.5% in most of the edifices; see M. Deoni-T. Kurent, *Modularna rekonstrukcija Emona: The Modular Reconstruction of Emona*, Ljublijana 1963; another reason for the incidence of this difference may lie in the use of a short pole in determining a large measurement in

(n. 183 see p. 45)

Since the squares ABCD, EFGH, IJKL and MNOP are arranged concentrically, the harmonic enlargement may be pursued according to the basic square ABCD.

The square is divided into four small squares; from these, two are selected – for example, XC_1CC_2 and D_1XC_2D, with a common length line, C_1D_1, which assumes the role of the basic square ABCD. The graphic system being the diagonal projection of the half-square XC_1CC_2 on the extension of basis XC_1 provides the basic auron $XC'C^{\circ}C_2$. This auron determines half the width of the next harmonious square EFGH (see fig. 2).

This graphic system is exemplified in Fig. A, together with the control made for it by a harmonious division (according to the golden section) of a straight angle triangle.

By turning the entire system 45° around its vertical or horizontal axis, the result obtained is a system of octagonals–octograms [184].

This system determines exactly the location and dimensions of the rooms in the first ring of rooms around the central court (rooms D, F, H, K, M, O, Q, R).

The same principle pertains to the dimensions of the second ring of rooms (A, E, G, J, L, N, P, S) as well as to the form and dimensions of the perimetric octagon.

The internal logic of this peculiar geometric structure negates and rejects all the elements of the internal structure (see figs. 1, 2; in fig. 2, the elements which do not belong to the original octagon are marked with darker shades); this assumption may be corroborated by excavation. For the present, we shall have to be satisfied with the results of the modular and the metrological analyses.

Modular Analysis

Clarification of the modular properties [185] of the octagonal structure should prove the geometric system discernible in the plan, as well as un-

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the area; see P. Underwood, « Some Principles of Measure in the Architecture of Justinian », *Cahier Archéologique*, III, Paris 1948, 63 ff.

[183] The basis of the auron (fig. A/C) is $ø \times ½$, and the base of the square is therefore $ø = ø \times ½ \times 2$.

[184] The role of polygonals in planning: E. Moessel, *Die Proportion in Antike und Mittelalter*, Münich 1926; M. Texier, *Geometrie de l'Architecte*, Paris 1934; G. Lesser, *Gothic Cathedrals and Sacred Geometry*, London 1957. Specifically, N. Spremo-Petrović, *op. cit.*, 96; L. Hautecoeur, *op. cit.*, 260; von Wersen, *op. cit.*, 40.

[185] Le Corbusier, *Le Modulor*, Boulogne, Paris, 1951; Ch. Chipiez, « Le systeme Modulaire et les Proportions dans l'Architecture Grecque », *Revue Archeologieque*, III, s.t. XIX, Jan.-Juin 1892, 3 ff.; M. Detoni-T. Kurent, *op. cit.*, 56; M. Dieulafoy, « La Mosquee d'Hassan », *Mem. de l'Acad. des Inscr. et Belles-Lettres*, XLII, Paris 1914, 310 ff.

cover the system of measurements used in determining its dimensions. This clarification not only complements the explication of the plan of the structure but may also contribute to a wider view of its mathematical, harmonical and numerical properties, kept by the mediaeval architect as a professional secret.

Students of mediaeval architecture use three types of modules:

a) a « major » planning module [186] which delineates the entire layout of the structure; it is always expressed in an integral number of basic measurement units; composition formed graphically and irrationally thereby takes on rational values;

b) a « minor » basic module which forms the network base, according to which all the components of the structure undergo development;

c) constructive module [187], which determines the location of certain constructive components; it may be based on one of the two aforementioned modules.

This general division has certain advantages, especially for architectural treatment of types of basilicas, central and complex structures. The advantage of the three types of modules lies in their having a common denominator, by means of a certain basic measurment unit.

Since, in any case, the module is the result of the multiplication of certain measurement and since the perimeter of the structure is determined by further multiplication, it follows that the numeral is a very important factor in planning the structure. In the ancient period and in the Middle Ages, numerals intimate, in addition to their mathematical and harmonious properties, also a very definite religious and symbolic component. By comparing the results of the modular analysis with the harmonious equations, two basic approaches to planning are obtained, essentially different one from the other, a) a geometric system, according to which a selected dimension develops harmoniously toward architectural composition, and b) a modular system, in which a pre-determined series of numbers is multiplied by a certain measurement. In the first instance, structure measurements include measurement units differentials, the result of cognate values set according to a geometric process. In the second, more exact measurements are obtained, but the harmonic values of the structure remain very general.

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[186] M. Texier, « Les Relations Mathematiques dans les Proportions Monumentales », *Congrès International des Architects et Techniciens des Monuments Historiques*, Paris 1957, 330 ff.; M. Detoni–T. Kurent, *op. cit.*, 28, 50; N. Petrović–N. Spremo, *op. cit.*, 88.

[187] Ch. Funk–Hellet, *De la Proportion, l'équerre des Maitret d'Oeuvre*, Paris 1951, 23; M. Zloković, *Multiple du Module de Basse, Essai d'une Systematisation des Nombres Preferanciels dans le Domain de la Coordination Modulaire*, Belgrade 1961, 22.

The use of irrational, mathematically not calculable numbers (only geometrically), in the ancient era and the Middle Ages, tends to complicate the matter even further. Insufficient familiarity, lack of uniformity and the inconvenient use of metrological systems, applied in various Islamic periods, anthromorphic and sexazimalic in their nature, make it even more difficult to uncover the measurement units used to determine the measurements of the structure.

Analysis of the complicated system of the structure points to the exact geometric development of the network of structural planning. The general character of the plan was pre-determined, in this manner.

We must firstly elucidate the modular properties of the structure, then compare the results with the geometric plan.

As we were leaving the well-preserved court, we noticed that its width (8.30 m.) was also the number obtained by multiplying tenfold the dimensions of the narrow sides of the walls which formed this court (fig. 2). This measurement is also relevant to the width of the columns, on the internal facade of the perimetric octagon (0.83 m.), as well as the intervals between them (0.83 m. × 3 = 2.49 m.). For further precision, we divided this measurement in two: 0.83 : 2 = 0.415 m.; by transferring this modulus to other elements in the structure we obtained the results shown in fig. 2.

This indicates that the diameter of the central court is 20M; the width of the first ring of rooms is 6M; the width of the second ring, together with the thickness of the wall surrounding them, is 10M; the width of the external court is about 16M; the width of the external octagon is 18M, of which 6M form the width of the external wall of the entire structure. The diameter of the entire structure is 120M. From its center, along one of the main axes there is the modular series of 18, 16, 10, 6, 10. The dominant factors are the numbers 10 and 6. An analysis of the internal facade of the perimetric octagon yields similar results. We begin with side SS (the distance between points *y* and *z* in fig. 2): the axial pillar is 2M; the spaces on either side – 6M; the continuation of side SS northwesterly is a wall with an opening in it, about 10M together.

It should be assumed that the situation southwest of the axial pillar is identical: side PP plus the distance between points *x* and *y* include two columns 2M wide each, plus spaces of 6M and a northern wall with an opening of about 10M. The modular values fit perfectly the columns and the spaces between them, as well as the two sides; the preciseness diminishes as we proceed toward the corners.

The overall length of side SS (to the extent that it is symmetrical) totals 14.64 m. (= 7.32 m. × 2). The calculation of that side SS, according to the golden section, comes to 14.62 m., while the calculation according to modules is 34M = 14.11 m.

The difference between the measured length and that obtained by the modular calculation is 0.53 m.; to the extent that side SS is symmetrical, 0.27 m. will be left on each side.

In side PP, from its two corners and towards its center, there is a wall 2.5 m. = 6M long, as it is also in side SS, from extant corner *y* to the door opening. This means that there is a modular division of the facades of the two sides. The door width in side SS is 0.90 m.; from the wall to the passage is 1.00 m.–1.90 m. in all, while 4M = 1.66 m. only, so that the excess difference of 0.27 m. si absorbed into this door opening and this wall. This solution was achieved also in side PP (cf. fig. 2, 1).

In side PP, two features distinguish the facade components from side SS:

a) This side has two columns and three intervals in between, while side SS has one column only;

b) its northern section protrudes from the geometric corner, at point V (see fig. 2), as a result of the architect's repetition of the motif of the door opening, as it appears in side SS, whereby he created certain progressive rhythms. It would be interesting to know the evolution of this method in the other sides. We are not inclined to believe that functional reasons alone dictated these dynamics. More likely, this is an expression of the architect's own refined taste, as he sought to break the monotony of the internal facades of the perimetric octagon. Obviously, a walk around the exposed and blocked up walls of the internal octagon was not inspiring. Through this rhythm, the architect gained the twofold effect of variegation as well as a clear orientation along the open corridor.

In the light of this discussion, the modular composition of side AA, into which the southern gate is located, attains special significance.

Only one column, 0.83 m. wide, visibly protrudes from side AA above ground. Its location prescribes for side AA the following series: 10M, 2M, 10M, 2M, 10M, with a 1M estimated difference between the modular and the estimated values. The remains of the western side of the southern gate show that the wall width is about 6M and the entrance chamber width is 10M. We assume this room to have been 10M × 10M, with an additional room on either side; their reconstruction is shown in fig. 5.

The thickness of the wall – 1.35 m. – surrounding the internal octagon does not fit into the modular system; its width is the result of the geometric treatment of the planning. This may be proven mathematically by subtracting the diagonal of another harmonious square, say efgh, from the width of a third harmonious square, say IJKL, as presented in fig. 2.

$$\tfrac{1}{2}\,(8.30^{\varnothing 2} - 8.30^{\varnothing}\ \sqrt{2}) = 1.37\ \text{m.}$$

The measurements of the second ring of rooms (G, J, L, N, P), located around the internal court, are on an average of 4.80 m. × 2.00 m., and the ratio is again 1 : 1.65, the nearest value to the harmonic proportion of 1.618 = ø.

The measurements of these rooms are also a direct result of the geometric approach.

The width of rooms' entrances D, F, H, K, M, O, Q, R, located in the first ring of rooms, fluctuates between 2.55 m. and 2.65 m. These measurements are the residue of the dimensions of the basic octogram sides (AaBbCcDd); the depth of those rooms is 2.55 m., on the average – 5 to 6 cm. more than the modular value 2.49 m. = 6 × 0.415 m. = 6M.

The conclusions are thus as follows:

1) The modular division creates values slightly lower than the real, in two instances:

a) as we draw farther away from the center, along the axes;

b) as we draw away from the axis of the internal facade of the perimetric octagon, toward its corners.

2) The modular division presents rhythmic use of the numbers 6, 10, 16.

3) The modular analysis shows that the plan is based on a geometric approach and that the modular division was used only as further means for the design of the facades.

Entrance rooms A, D, parts of rooms E, F, the partition wall at the entrance to room K and part of the external southern facade of the central octagon – these, too, do not fit into the modular network of the plan. The same non-fitness applies also to the geometric analysis. These elements may belong to a later period, one or more; their full explication is impossible without archaeological excavation.

We shall therefore try to come upon the most reasonable explanation, by metrological analysis.

The first floor of the internal octagon is so demolished that even clearing the debris away will not yield any better results than those shown in fig. 3.

In this instance, the metrological properties form the sole complementary item we have for explaining its connection with the ground floor. The staircase and stairs still extant in room D end above the floor level of the first floor; presumably, these stairs once led to the roof or to another floor (of which no trace has endured).

The Role of the Number in the Planning

The prominent role of the numbers 6, 10, 16 in the composition of the basic elements of the plan, as well as in the design of the facades of the perimetric octagon [188], is in itself proof of the role of the golden section in planning the qal'a. These are the ideal numbers in classical harmony; Vitruvius arrived at the *numerus perfectus* (16) by adding Euclid's ideal number (6) and Pythagoras's (10) [189].

The numbers 6, 10, 16, set in their basic form of 3, 5, 8, also belong to Fibonacci's first series [190] 1, 2, 3, 5, 8, 13, 21, 32, 55... whose members are arranged in rations of 5 : 8 ,3 : 5, providing the values approximating the golden section number 1.618 = ø.

Obviously, the mediaeval architect [191] was no stranger to these elements of classical harmonic theory [192].

The Metrological System

Before going into the matter of the measurement units used in planning the qal'a, it is desirable to note several aspects of the later Islamic metrology [193]. To date, it should be emphasized, no adequate redaction

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188 It would be interesting to compare the modular scheme of the perimetric octagon facades in Ṭīna, based on 16 modules, with the terms of the tender of the Duomo in Milan, in 1932. According to the *Annali della fabrica del Duomo di Milano*, it is known that the width of the church (naos) was set, at the center, at 96 bracci, these being 6 × 16; participants in the tender were to adapt the plans of the cross-sections and facades to this specification. In this we may discern the presence of the golden section and the numerus perfectus of Vitruvius in the infrastructure for planning this edifice. A. M. Romanini, *L'Architettura Gotica in Lombardia*, I, Milan 1964, 351 ff., figs. 86, 87, 88.

189 See « De Architectura Libri Decem », III, 1 : 1–8 (ed. F. Granger, London, 1931–1934, *Loeb Classical Library*); M. Detoni–T. Kurent, *op. cit.*, 36. 62 (Picture 34)

190 « Liber abbaci a Leonardo filio Bonacci compositus, anno 1202 et accrectus ab eodem anno 1228 » – *Il liber Abbaci di Leonardo Pisano*, Roma 1857. Here we find the first mention of the Fibonacci series, the geometric solution of the famous riddle about « domesticated squirrels ». Thus, only in the 13th Century do we find a recurrent series U_n–1 + U_n + 1, that is, 1, 2, 3, 5, 8, 13; 8, 13; cf. M. Zloković, *op. cit.*, 14 ff.; M. Detoni—T. Kurent *op. cit.*, 60, 61 (Picture 33).

191 G. Downey, « Byzantine Architects, Their Training and Methods », *Byzantion* XVIII, 1946–1948, 115 ff.; L. A. Mayer, *Islamic Architects and Their Works* », Genève 1956 (introduction); U. Monneret de Villard, *Introduzione allo Studio dell'Archeologia* Islamica. Venezia–Roma 1966, 299–310.

192 S. H. Nasr, *An Introduction to Islamic Cosmological Doctrines*, Cambridge, Mass., 1964, 47–52.

193 W. Hinz, Islamische Masse und Gewichte, Leiden/Köln 1971, 54 ff.; *idem.*, EI² II, s.v. DHIRĀ', 231–232.

has been made of the known metrological data, and their incorporation in Islamic structures is still insufficient.

Islamic metrology contains two fundamental systems:

a) The Kanonic system, based on the measure of the finger (*aṣba'*), 2.078 cm., and

b) the applied system, based on a finger measure of 2.252 cm.

Multiplication of these measurements by sizes produces the cubit (*dhirā'*), equal to 49.875 cm.; the applied cubit, accordingly equals 54.040 cm. The two cubits contain 6 *qabḍāt*, one equal to 8.30 cm. and the other to 9.00 cm.

Most of the other measurements will result from the increase in the number of *qabḍāt* (cubits). In addition to the Kanonic and the applied systems, there were in use, at that time, special measurements for professional needs – trade, fabrics and construction, for example. The very need for more measurements indicates that the two aforementioned measurements caused some inconvenience. Analysis of the nature of this inconvenience and the metrological character of the corrections introduced there – it may in themselves provide an interesting study. We shall limit our brief remarks to the construction measurements.

According to Hinz, the small construction cubit measured 50.30 cm. and the large one 79.80 cm. Historical sources do not reveal the nature of the connection between them, but if we rely on the fact that the construction cubit was 5/8 of the hand–cubit, equal in size to the Kanonic cubit of 49.875 cm., it would appear that about 10 cm. represent the *qabḍa* of the construction. We have no intention of introducing new measurements into Islamic metrology, but shall emphasize two pertinent facts:

a) In his study of the Ḥasan Mosque, Dieulafoy [194] found that the ancient Moroccan *chber*, equal to 20.074 cm., and half of it (10.073 cm.) constitute the metrological basis of the plan of the Mosque;

b) the 5 : 8 ratio, which forms the connection between the large building cubit and the hand cubit, is of significacne in Fibonacci's first harmonic series.

It is further noteworthy that the measuring pole (bāb), 3.99 m. long, as well as the measuring tape (ašl), 39.90 m. long, may be easily divided into 8 (or 80) small cubits and 5 (or 50) large cubits.

Thus a scale is obtained, suitable for light measurement of areas and volumes of harmonic adaptation.

Since the Islamic metrological systems, like the Byzantine and the western, changed during the same period from region to region, a metrological analysis is not easily performed.

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[194] M. Dieulafoy, *op. cit.*, 314.

Studying the modular properties of the qal'a, we noticed that the multiplication of measurements of certain elements have affinity to the width of the central court. The geometric analysis also shows that the central court carries the basic motif in the plan of the structure. According to Hinz's metrological list, the width of the central court (8.30 m.) corresponds to the Kanonic *qabḍa* (8.31 cm.).

Multiplication of the Kanonic *qabḍa* by integral numbers, from the decimal system, produces the following measurements:

a) Width of the central court: 8.31 cm. × 100 = 8.31 m.

b) Width of the sides of partitioning walls, facing the court, 8.31. cm. × 10 = 0.831 m.

c) Width of the pillars in the facades of the perimetric octagon 8.31 cm. × 10 = 0.831 m.

d) Width of the spaces between the pillars 8.31 cm. × 30 = 2.49 m.

The results of the comparison of the main squares [195], according to the Kanonic *qabḍa* and the applied *qabḍa* are set forth in Table III.

Table III – *Comparison of the Dimensions of Harmonic Squares According to Different Measurement Systems and the Golden Section*

Squares	Basis of Squares	Measured in m	q	Calculated by q in ø System m tested	$100q\text{ø}^n$	q	q diff.	Qanon. Cu. 6q	Qanon. Cu. 8q
ABCD	D_1C_1	8.30	100	8.31	100	100	—	16⅓	12½
EFGH	D'C'	13.45	162	13.46	100ø	162	—	27	20¼
IJKL	H'G'	21.95	264	21.93	100ø^2	262	+2	44	33
MNOP	L'K'	35.41	426	35.40	100ø^3	424	+2	71	53¼
mnop	mo	—	$426\sqrt{2} = 600$	49.85	$100\text{ø}^3\sqrt{2}$	597	+3	100	75

q = *qabḍa* m = meter

These results indicate a certain preference given to the Kanonic cubit [196]. In line with the same metrological examination, the architectural details are given in Table IV.

Table IV – *Architectural Details Computed According to Kanonic and Applied Cubits*

Architectural Detail	m	q	Cubit of 6q	Cubit of 8q
Narrow side of partition walls, facing central court	0.83	10	1 2/3	1 1/4
Width of internal octagon wall	1.35	16	2 2/3	2
Spaces between columns in perimetric wall facade	2.49	30	5	3 3/4
Depth of rooms H, K, M, O, Q	2.57	31	5 1/6	3 7/8
Width of rooms G, J, K, N, P	2.90	35	5 5/6	3 3/8

[195] Slight deviations of the measurements of the square IJKL (264 qabḍa instead of 262 on the diagonal) from the exact harmonic measurements, are transferred to the next square, MNOP.

While the results in Table IV show that neither of the two cubits enjoys priority, the combined results of Tables III and IV again indicate that the Kanonic *qabḍa* was the common measuring unit, for the architectural details as well as the plan's compositional squares.

The role of the golden section, in setting the dimensions of the main squares, is thus made clearer, as is the decimal nature of the dimensions of the central court, the width of the pillars, and the intervals between them.

In selecting the proper means of measurement for determining the dimensions of the structure, a twofold problem arises: first, in Islamic metrology there is no known measurement consisting of 10 basic units; secondly, it is improbable that such sizes as 600, 426, 264... small units (*qabḍa*) were set directly in the area. The direct measurements in the field therefore make it impossible to decide whether the Kanonic cubit (6 *qabḍa*) or the applied cubit (8 *qabḍa*) was in use.

There still remains the study of the metrological nature of the diagonals of the basic squares [197]. Since diagonals play a decisive role in the planning and the graphic delineation of irrational numbers, there is good reason for examining them for the connection between 2 and the golden number, which represent two important compositional subjects in the plan.

It has already been noted by Михайлов [198], that, beginning with the sixth member (11.08), this series corresponds with modular planning.

Comparison of the lenght of the diagonals of the basic squares and the aforesaid members of the harmonic series computed in *qabḍāt* are set forth in Table V.

Table V – *Harmonic Enlargement of Squares by Multiplying Members of Golden Section by Constant* 3

	Diagonals of Squares			Square		Bases of Squares		
Σq	$ø^n 3q$	q	$qxø^n x\sqrt{2}$		$qxø^n$	q	$3^2q \times ø^n$	Σq
141	47 × 3	141.4	$100\sqrt{2}$	ABCD	100	100	$3^5q \times 11$	99
228	76 × 3	228.13	$161.8\sqrt{2}$	EFGH	100ø	161.8	$3^2q \times 18$	162
369	123 × 3	369.13	$261.8\sqrt{2}$	IJKL	$100ø^2$	261.8	$3^2q \times 29$	262
597	199 × 3	597.27	$424\sqrt{2}$	MNOP	$100ø^3$	423.6	$3^2q \times 47$	424

q = *qabḍa*

[196] There is the possibility of technical error in the planning, or in the implementation of the plan on the site.

[197] By placing the enlarged value of the diagonal of the square MNOP (426 qabḍa instead of 424) on the base of the square which surrounds the entire fort (see fig. 3, Tables III, V), the result obtained is a 600–qabḍa width of the perimetric octagon, that is, exactly 100 kanonic cubits. In view of the precise planning of the structure, it may be assumed that the second possibility is the correct one.

[198] Б. Л. Михайлов, *op. cit.*, 64, fig. 24.

This experimental comparison has several advantages:

a) A dominant role is played by the constant factor – the numeral 3 or its multiples. This method also alows an examination of the geometric method, avoiding computation of irrational numbers.

b) The method makes it possible to choose freely the measurement of the base or the diagonal or any harmonic square whatsoever, and to examine directly (by means of the table) all the measurements of the other harmonic squares. This enables the planner to fix the measurements of the structure, in line with various conditions or demands of the area.

c) The decimal surpluses, as set forth in Table V, do not exceed 0.30%; therefore, in planning and effecting the plan, they may be disregarded.

By computing the diagonals of the basic squares according to the above method, it is apparent that the Kanonic *qabḍa*, enlarged threefold (8.31 cm. × 3 = 24.93 cm.), is equal to half the Kanonic cubit – 49.875 cm.

Half the Kanonic cubit (3 Kanonic *qabḍa*) is a measurement representing the metrological basis of the plan of the structure.

Based on the aforesaid, we may distinguish two stages in the determination of the structure's dimensions:

a) Choice of the ½ Kanonic cubit as a basic unit and its transfer to the geometric schema;

b) designing the facades by employing the decimal products of the Kanonic *qabḍa* (8.31 cm.), supported by the basic members of the numerus perfectus ($^6/_2$, $^{10}/_2$, $^{16}/_2$).

This proves the close connection between all the planning stages, on the one hand, and the coordination existing between the results of the geometric, modular and metrological analyses, on the other.

Reconstruction

The attempt to reconstruct the qal'a faced two main problems:

a) The structure is only partly above ground; only one course of the internal facades of the perimetric octagon is above the surface, at a height of the door lintel (see fig. 1);

b) the first floor of the internal octagon is in almost complete ruin (fig. 2); there is no remnant of the roof or of the second floor, if indeed there was one.

Distinguishing between the different construction stages and reconstructing them is based primarily on the results of the architectural analysis. This analysis indicates that the internal and the perimetric structures had an elaborate octagonal form.

The question is whether more floors had existed, in the first stage. As far as the internal structure is concerned, this was confirmed by the thickness of the walls and the remains of the first floor (from a later period). Regarding the perimetric octagon, there is nothing on the site to suggest the existence of another floor. Another interesting item in this context is whether the court was opened or domed; the thickness and location of the walls, on the ground floor of the internal structure, hint that they might have supported a dome.

If so, this may be analogous to the corner towers of the Cairo fort [199] (12th Century), whose dimensions and room dispositions are very similar to the inner structure at Ṭīna (see Creswell, *ibid.*, fig. 18). The reconstruction of the first construction stage plan is shown in fig. 4.

The second construction stage has been preserved better.

It should first be noted that entrance rooms A, D and stairwells B, C do not correspond to the compositional, harmonic and metrological system of Stage I. While not all of their dimensions are known, they nevertheless point to the use of the black Egyptian cubit (54.040 cm.) as the basic measurement unit. In room A, the width of each of its four flanking openings is 1.10 m., on the average – 54.040 cm. × 2 = 108.16 cm.; the northeastern and northwestern corners of that room are 14.00 cm., equal to ¼ of the applied cubit (54.04 cm. : 4 = 13.5 cm.). The depth of this room, as well as the internal width of the door leading into room D, is about 2.20 m., equal to two applied cubits.

This fact indicates, with great clarity, that metrologically Stages I and II differed from each other. Because of this differentiation, it should be assumed that they were built in two different periods. On the one hand we cannot determine, in this analysis, the chronological gap between the two periods, since these two Islamic metrological systems far antedate the building of the qal'a; on the other hand, the Islamic identity of the architect may be definitely derived from the metrological nature of the two stages.

Stage II takes in rooms E, F, R, as well; the difference in their form and length may be but the result of the difference in their roles. We can readily see, that after the integration of stairwells B, C in the earlier structure, the remaining area was used maximally for rebuilding rooms E, F. In room R, on the other hand, the use of the vacant space was far more discriminative; its different vaulting and emphasized southern direction (toward Mecca) substantiate the conjecture that this room served as a mosque. This also explains why room S went into complete disuse in Stage II (cf. figs. 1, 2, 4).

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[199] K. A. C. Creswell, *The Muslim Architecture of Egypt*, II, fig. 18.

On the first floor, the dimensions of room A_1 are basically identical with those of room A, on the ground floor. The thickness of the wall of room E_1, which faces the center, is 1.10 m., equal to two applied cubits. The thickness of the walls separating rooms G, J is about 55 cm., equal to one cubit. Of the parapet, which ran along the corridor surrounding the interior (connecting the rooms on the first floor) only a solitary segment remains, suggesting that a parapet did exist. The question is whether the corridor was roofed and, if so, with what, nor do we know anytthing about the elements which might have supported this roof.

On the second floor, the only item to survive is part of the wall, separating rooms B_1A_1, to which remnants of the steps are still attached, leading to the second floor; these steps were on the threshold level of rooms E_1, B_1, A_1, on the ground floor. This means that what we know at present is not enough to enable us to choose between one of the two possibilities: a) the existence of a chemin de ronde on the second floor or b) that the second floor was only partially built, the rest having been an open terrace.

In support of the second possibility, we may note that the thickness of the walls of rooms E_1, A_1, B_1, C_1, S_1, which face the center, are double than of the walls with a similar function in the other rooms, i.e., they are capable of supporting another floor, unlike the others, in this respect. From the aforesaid, it would appear that we do not have sufficient data for a reasonable graphic reconstruction of the second floor.

As mentioned, very little of the external structure is visible. Its external perimeter may readily be identified by the location of the southern gate. Recent building remains in room PP and a wall opposite room L (of the internal octagon) formed the basis for the reconstruction of the wall of the qal'a (see fig. 5).

From entrance room AA, close to the southern gate, only a few segments are visible, making it difficult to mould them into a complete entity. By repeating the broken line motif on the internal facade, on the side wall near it, another small room became apparent, opening into room AA and the court. Repetition of the same motif beyond the eastern side of the gate revealed a depiction characteristic of entrances of monumental Islamic edifices.

The disposition of the walls, entrances and Columns in the perimetric structure points to the existence of several exedra and closed rooms alongside.

The the reconstruction of the perimetric structure, the corridors and the rooms were given maximal dimensions, leaving minimal space for the structural walls.

The architectural analysis of Qal'at al-Ṭīna, therefore, answers the

question of the nature of the edifice, from the standpoint of proportion and disposition, structure and metrology. These may be synoptically summarized as follows:

1) The structure is an architectural and compositional entity;

2) The compositional scheme is formed of four squares, created by harmonic enlargement according to the golden section. This layout of squares, turned 45° about their main axis, form a series of concentric octograms, into which were set the internal and the perimetric octagons of the structure;

3) the modular analysis proved the domination of the geometric system in the planning, as well as the use of modules in designing the facades of the perimetric octagon ;

4) the metrological analysis pointed to the use of two Islamic measurement systems: a) the Kanonic (based on the Kanonic cubit of 49.875 cm.); b) the applied system (based on the applied cubit of 54.040 cm.);

5) the results of the compositional, proportional, modular and metrological analyses therefore determined the existence of two construction stages: Stage I – including the internal and the perimetric octagons; Stage II – including those structures, plus stairwells B, C and alterations in rooms A, D, R, S, F, E. This stage also takes in the remains of the first floor, preserved to this day, as well as the remains of the steps which led to the second floor or to a terrace. Certain parts of the southern gate also apparently belong to Stage II;

6) The use of two distinct Islamic metrological systems, alongside characteristic structural and decorative features, makes possible the Islamic identification of the edifice;

7) This Islamic fort, of rare aesthetic quality, shows a unique feature: its definied layout is identical with that of the Dome of the Rock [200],

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[200] This conclusion, which we had already reached after an exact architectural analysis of the Dome of the Rock, found further support in Fontaine's remark, based on Clédat, « *Son architecture (de Qal'at al-Ṭīna) correspondait dans l'ensemble à la disposition générale de la Mosquée d'Omar* (VII *siècle*) *de Jérusalem qui servit sans doute de prototype* (*Clédat* », *Enquête*, 36). The analysis of the Dome of the Rock is too comprehensive to be integrated in the herein framework. Inasmuch as it will be published in a separate work, it will suffice to present here a summary of the conclusions obtained from a comparison of the external dimensions of the two edifices:

1 – *Dome of the Rock*, K. A. C. Creswell, *Early Muslim Architecture*, Oxford 1969, 74 ff. The width of the structure is calculated according to the general equation $A = a (1 + \sqrt{2})$.

a) For the calculated average value of a side of the perimetric octagon:
$DE = 20.57$ m., $A = 20.57$ m. $\times (1 + \sqrt{2}) = 49.57$ m.

b) For the measured average value of a side of the perimetric octagon:
$DE = 20.59$ m.; $A = 20.59 \times (1 + \sqrt{2}) = 49.62$ m.

the first and most outstanding monument of early Islam (see Fig. B). This fact is of major architectural, symbolic and historical significance.

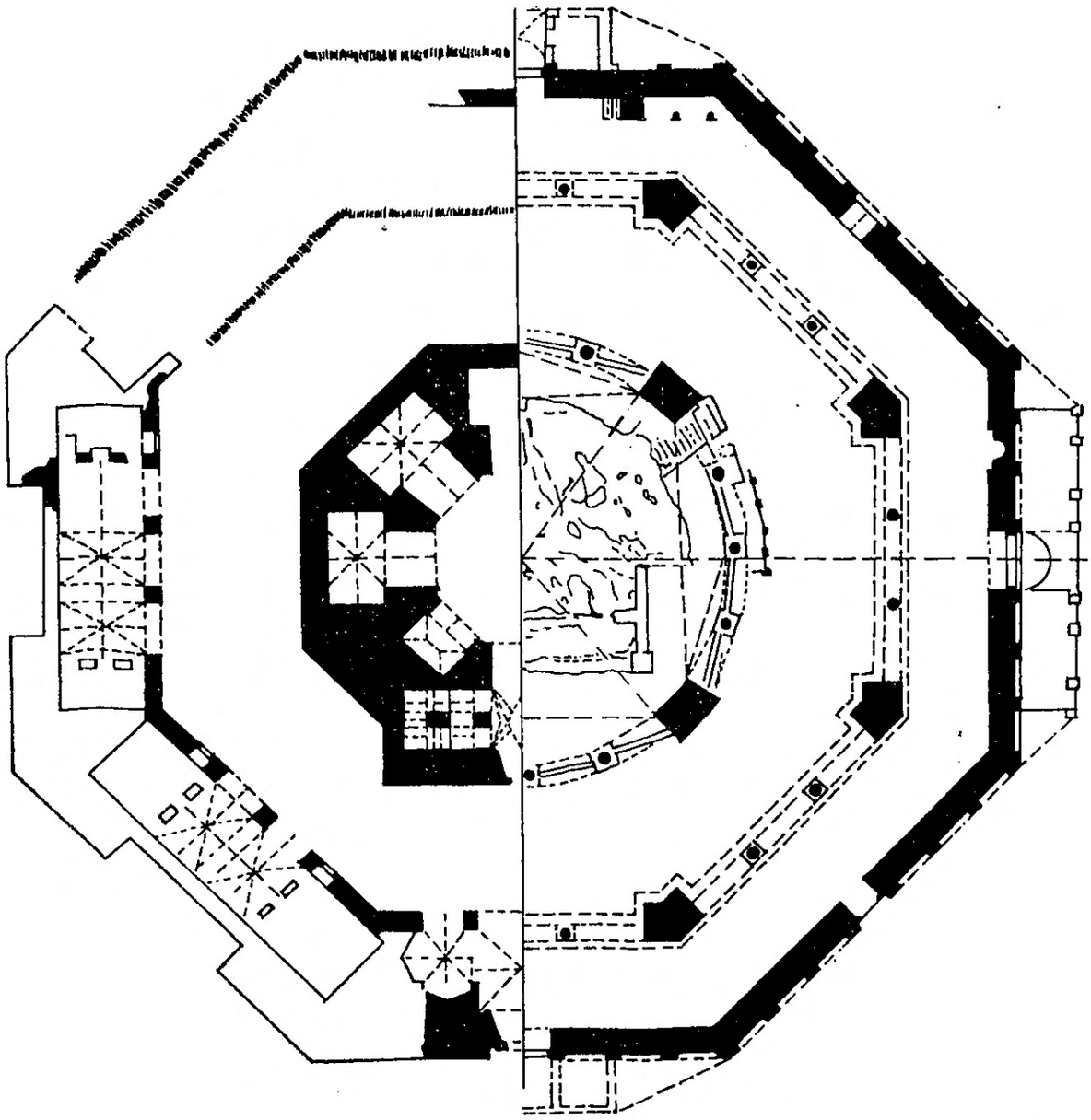

Fig. B: *Adjuncture of the Plans of the Dome of the Rock (right) and Qal'at al-Ṭīna (left)*

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2 – *Qal'at al-Ṭīna*

a) Width of the fort according to measured values:
(L'K') × $\sqrt{2}$ = 35.41 m. × $\sqrt{2}$ = 462q × $\sqrt{2}$ = 600q = 49.86 m.

b) Width of the fort (see Table III):
The ideal harmonic width (q = kanonic qabḍa – 8.31 cm.):
8.30 m. × $\varnothing^3$ × $\sqrt{2}$ = 100q × $\varnothing^3$ × $\sqrt{2}$ = 597q = 49.61 m.

Comparison of the width dimensions of the Dome of the Rock (based on Creswell's accurate data) shows a maximal deviation of a total of 9 cm. (49.66 m. minus 49.57 m.), i.e., less than 0.20%. The average calculated value of the width of the Dome of the Rock is completely identical with the ideal harmonic width of Qal'at al-Ṭīna (49.62 m. vis-a-vis

TYPOLOGY: QAL'A III

(A) The present state of study of octagonal planimetry, while still lacking its complete and comprehensive corpus may apparently be defined by two basic characteristics: on the one hand, the relatively wide diffusion of the religious octagonal plan (which accounts for the synthetical works of such scholars as Ugo Monneret de Villard [201], Richard Krautheimer [202], and André or Oleg Grabar) [203], and, on the other hand, the limited diffusion, in absolute terms, of the military octagonal plan. This is to say, that despite the relative tactical advantages of the polygonal fortification [204], which, as a compromise between the quadrilateral and the circular plan, is distinguished by its more effective potential for static defense and external attack, the application of the octagon, in the Middle Ages, was no more than sporadic [205].

49.61 m.) and the possibility of maximal difference may be 29 cm. (49.57 m. 49.80 m.), i.e., less than + 0.60%.

The results obtained are most gratifying, considering the fact that only part of the qal'a could be measured directly (according to the axis of the southern gate – the central court.

In this context of the Dome of the Rock, see also the comments of Basilio Pavon Maldonado, *El Arte Hispano–Musulman en su Decoracion Geometrica*, Madrid 1975, 143–145, regarding the octagonal application in the classical and mediaeval architecture and geometrical decoration.

201 « Note di Archeologia Lombarda », *Archivio Storico Lombardo* 1914, 5–70; idem, *Introduzione allo Studio dell'Archeologia Islamica*, 185–196. See also the work by G. d'Angelis d'Ossat, *Origine e Fortuna dei Battisteri Ambrosiani*, Arte Lombarda XIV, 1969, 6 ff.

202 R. Krautheimer, « Introduction to 'an Iconography of Mediaeval Architecture' », *Journal of the Warburg and Courtauld Institutes* V, 1942, 1–33.

203 A. Grabar, *Martyrium I*, Paris 1946/1972, 141 ff.; O. Grabar, « The Earliest Islamic Commemorative Structures », *Ars Orientalis* VI, 1966, Nos. 1, 2, 45, 66, 67, 70, 103, 106. Also, P. Sanpaolesi, « La Cupola di Santa Maria del Fiore ed il Mausoleo di Soltanieh », *Mitteilungen des Kunsthistorischen Instituts in Florenz*, XVI/3, 1972, 221–228, 238. Cf. d'Angelis d'Ossat, *ibid.*, *ibid.* Idem, « Sugli Edifici Ottagonali a Cupola nell'Antichità e nel Medioevo », *Atti del 1° Congresso Nazionale di Storia dell'Architettura*, Firenze 1938, 19 ff.

204 A. Châtelain, *ibid.*, 7.

205 Although the polygonal plan has been applied – in different variations – to mediaeval military architecture both in major western forts (as in France and the Lowlands in the Gothic period – Gand, Château–Gaillard, Boulogne, Angers, Vieil–Herdin, Nantes) as well as to eastern forts (as in Syria and the Peloponnese even before the Gothic period – Crac des Chevaliers, Clermont/Chlemoutsi), its alignment with the topographical configurations was mostly irregular. Without going here into details about the cause of the irregularity, which, besides the configuration of the terrain, might have emanated from considerations of internal convenience distribution or from the detachment of the mediaeval architect from the rigidity of engineering symmetry (in adherence to his desire for the functional implementa-

The application of the octagon is apparent in two main architectural contexts: 1) as a fortified tower or donjon, being an organic component in a complex of fortifications; 2) as a compact, autonomous and intricate fortifications system. Without going into their historical and structural details, which are not always sufficiently clear to begin with, we find, typical of the first group, the Norman donjon in Chilham [206] in Britain, the Albarranas towers, built by the al-Muwaḥḥidūn in the second half of the 12th Century in the external section of the walls of the *qaṣabāt* in Ecija, Badajos, Caceres, and Jerez de la Frontera, in Muslim Spain [207]; the Steinberg Burg, rebuilt in the second quarter of the 13th Century in Kraichgau, Germany [208], the donjon in Fort Largoet-En-Elven, built in the second or third quarter of the 14th Century. in Brittany (France) [209], and the Maschio in the coastal fort at Civitavecchia, planned and perhaps begun by Bramante in 1508, continued by Antonio da Sangallo and Giuliano Lano, and its upper portion completed by Michelangelo in 1535, in Italy (see G.M. de Rossi, *Torri Costiere del Lazio*, 31, 35). In the second group there are several European works and one Muslim: on the one hand, the Burg built in Egisheim c. 1200 (Upper Alsace, Germany [210]; Castel del Monte, built

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tion of his work), it would seem that more or less regular forts (as in France: Bouillan-Cour-en-Sery and Billy, or in Belgium: La Royere, Reves, Fouke) were quite rare. See P. Héliot, « Le Châteaux de Boulogne-sur-mer et les Châteaux Gothiques de Plan Polygonal », *Revue Archéologique*, 6e Serie, XXVII, 1947, 41-59; A. Bon, « A Propos des Châteaux de Plan Polygonal », *ibid.*, XXVIII, 177-179. In this context of the regular polygonal forts, it is therefore needless to emphasize the rarity of the octagonal plan. The following examples therefore do not include the works from the ancient period (such as the entrance towers in the palace of Diocletian in Spalato/4th Century, for which see K. Swoboda, *Römische und Romanischen Paläste*, Wien 1924, 149-160; the Praetorium of Köln/4th Century, for which see M. Cagiano de Azevedo, *Ville Rustische Tardoantische* etc.; Agricoltura e Mondo Rurale in Occidente nell'Alto-Medioevo, Settimane... Spoleto, XIII, 1966, 671; or Castellum Agiualfi in Lorigana/5th Century, for which see G. Schmiedt, *Le Fortificazioni, Alto-medievali in Italia Viste dall'Aereo*; Ordinamenti Militari in Occidente nell'Alto-Medioevo, *ibid.*, Spoleto XV, 1968, II, tav. XXIX; for other examples, mainly Roman (plus bibliography) see also d'Angelis d'Ossat, *Sugli* etc., *ibid.*, 14 ff.

206 D. F. Renn, *Norman Castles in Britain*, London 1968, 141-142. See also the later Norman tower in Odiham (Hants), in G. T. Clark, *Medieval Military Architecture in England*, London 1884, II, 336-345; 337-339.

207 L. Torres Balbàs, *Ciudades Hispano-Musulmanas*, Madrid 1973, 569, 588-592.

208 R. Kunze, « Zur Steinsbergfrage », BS 1964/II, 41-42. The use of the octagon, in complexes other than religious, was quite widespread in 12th Century Germany; cf. the octagonal tower, with its religious-military function, in the Benedictine monastery of Seebach; O. F. Wülfing, *Burgen d. Hohenstaufen in d. Pfalz u. im Elsass*, 1958, 49.

209 J. F. Finò, *Fortresses de la France Médiévale*, Paris 1970, 392-395.

210 W. Hotz, *Kleine Kunstgeschichte der Deutschen Burg*, Darmstadt 1972, 20 + fig. 714.

by Emperor Friedrich II (1215–1250) near Andria (Apuglia, Italy)[211] in 1240; on the other hand, there is the qal'a built by Sulṭān Qānṣūh al-Ghawrī in Ṭīna, Sinai, in 1510.

The typological study of the qal'a should therefore be made in the light of its affinity – no more nor less – to Castel del Monte (which, on its part, is not unconnected with the burg at Egisheim)[212]. Withal, our interest in this unique work of the secular architecture in the Middle Ages – which, as of the end of the 18th Century, has gained an extensive commentary literature (not only because it represents the most distinguished document relevant to the creative genius of Friedrich II, but also because of its integration with the essentials of the origin and evolution of Gothic architecture in Italy) – will have to be limited to but one or two aspects of relevance to our discussion.

(B) 1) Hence, at any rate Friedrich II's construction of the octagon in Castel del Monte is but the fullest expression of the polygonal schema. At its isolated and lofty location in the core of Apuglia, its ground plan displayed octagonal wholeness in its perimetric layout, in its central court, in its eight corner towers, as well as in their rooms (with the exception of the circular stairwell). On the other hand, the same octagonal integrality dictated the trapezoidal form of the eight internal rooms, between the towers. This rare composition of architectural design, according to which the focal

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211 G. Chierici, *I Monumenti Italiani*, Reale Accademia d'Italia, Roma 1934, fascicolo primo. In this context, mention should of course be made of the octagonal tower built by Friedrich – apparently between 1239 and 1240 – in Enna, Sicily. For this see G. Agnello, *L'Architettura Militare, Civile e Religiosa nell'Età Sveva*, ASP XIII–XIV, 1960, 150–151. See also C. Samonà in Atti del *Convegno Internazionale di Studi Federiciani*, Palermo 1951–52, 517. Regarding its non-documented date, which may still be determined by a delineation of its plan and the lines of its stylistic features, see G. Agnello, *Problemi ed Aspetti dell'Architettura Sveva, Palladio* X, 1960, 43. Cf. also the less known octagonal tower in the Cosenza fort (M. Boretti, il Castello di Cosenza La Provvidenza 1940, 4 ff. + fig. 23). In connection with the octagonal plan, mention should also be made of the Frankish fort Scandelion (C. Enlart, *Manuel d'Archéologie Français*, Paris 1932, II/2, 613) and the two late forts of S. Héray (16th Century; Héliot, *ibid.*, 59, n. 5), and Pamele (17th Century; Héliot, *ibid.*, 53, n. 6). On the other hand, the importance of Torre di S. Michele (1568) has already been stressed.

212 The Egisheim fort, known mainly from literature, contained an isolated octagonal tower within an octagonal perimeter which contained trapezoidal rooms. This disposition was thus likely to have introduced a preliminary concept of that radial solution, later implemented in Castel del Monte; for Egisheim, as a precedent for Castel del Monte, see H. Hahn, *Hohenstaufen Burgen in Süditalien*, Münich 1961, 19; W. Hotz, *ibid.*, 20; for its affinity to the tower at Enna, see H. G. Waldburg-Wolfegg, *Von Nordreich d. Hohenstaufen*, Münich 1962 s.v. On the other hand, the assumption that Castel del Monte was influenced by the plan of Boulogne-sur-Mer (1228–1234) has already been rejected – justifiably – by Héliot (*ibid.*, 41–47). Lately cf. A. Bon, *La Morée Franque*, Paris 1969, 619–620.

weightiness of the structure is drawn around the central atrium (which, on its part, repeats the schema of the cortina and the towers), seems to correspond to the same normative conception, which, as it came forth, probably, from the imperial studio, is also revealed in several of the Emperor's previous works [213]. For despite the difference between them, such was also the case with Castel Ursino (Catania, Sicily, 1236), where the circular external structure of the corner towers is transferred to an octagon internally [214], as well as in the basically Roman bridge in Capua (Campagna, 1234), where the foundations of the towers – on either side of the triumphal arch – are octagonal [215], as well as in the massive « lookout » tower, square in its lower section but octagonal in its upper, in the Luccera palatium (Apuglia, 1233–35) [216].

While these works may not be forced a priori into a uniform typological group, they nevertheless manifest a single schema, perfectly computed not merely in its icnographic evolution, but also, at times, in the structural and decorative details: for example, comparison of the windows and niches in Luccera and Castel del Monte point to the similarity between them, the first certainly preceding the second in its polygonally spatial progression [217].

As far as we are concerned, however, the importance of Castel del Monte lies not so much in the exclusive representation of its plan as in its iconographical significance. Aside from and beyond its basic and prime strategic function, as a lookout, guardian and communications fort [218], regarded by Friedrich in the context of his security conception of urban and territorial defense (hence the diffusion of his fortifications network at strategic points along the coast and mountain ridges of Apuglia and Sicily), this military function – as also its definition as a hunting lodge [219] or even as a proto–Renaissance palace [220] – may be viewed as too simple and utilitarian for the grandiose octagonality of the monument. It is therefore not surprising that the effort to interpret the significance of the octagon

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213 An important elucidation of this material (with a full bibliography) is to be found in P. Natella–P. Peduto, « Rocca Ianula, Lucera, Castel del Monte: Un Problema Occidentale », *Palladio* n.s. XXII, 1972, 33–48.

214 H. Hahn, *ibid.*, 29–30.

215 Hahn, *ibid.*, 18, 32 ff.

216 Hahn, *ibid.*, 36–39.

217 H. G. Waldburg–Wolfegg, *Von Südreich d. Hohenstaufen*, Münich 1954, 42.

218 G. Agnello, *L'Architettura Militare*, *ibid.*, 156; P. Manzi, « Castel del Monte, Opera di Architettura Militare », BISCAG, 1965, 91–92, Roma 1966, 27.

219 G. Chierici, *ibid.*

220 W. Krönig, *Staufische Baukunst in Unteritalien*, *Beiträge z. Kunst d. Mittelalters*, Vorträge d. Ernst Deutsch. Kunsthistorikertagung auf Schloss Grühl (1948), Berlin 1950, 32.

deviated at times from the immediate functional sphere and was thrust into the symbolic or even mythic sphere. This is to say, the attempts to uncover imperial insignia or religious symbols in Friedrich's syncretic theory of architecture were not confined to the crown symbolism (according to which the castellum was the imperial crown of the Hohenstaufen in Apuglia) [221], or in the conception of the monument as the abstract architectural symbol of the city-state [222], but also, and mainly, as the conceptual realization of eternality [223]. Indeed, the architechtural projection of the cotagonal model, in itself, derived from the perfect number eight, represented in Christian doctrine of the Middle Ages as the symbolism of Jesus [224], may have negated the contradiction between church and state, between the human and the supernatural.

2) Now, without placing here the multi-functional castellum into the framework of a rigid typological catalogue (where one may distinguish Italo-Roman, Roman-Eastern, Byzantine-Muslim, Gothic and Cisterian elements) [225] it may be defined, in the final analysis, as the comprehensive architectural expression of that multi-cultural synthesis which Friedrich sought to achieve also in the political, religious and intellectual spheres. Beyond the characteristic attempts to compare it with other major octagonal representations known to the Emperor (such as Charlemagne's capella in Aachen, Friedrich Barbarossa's palace in Hagenau, St. Vitale in Ravenna or the Dome of the Rock in Jerusalem), it is possible that, as a singularly west European work, Castel del Monte is comparable with the work of the founder and great ruler of the Moghul Empire in Hindustan, Abū al-Fatḥ Djalāl al-Dīn Muḥammad Akbar Pādīshāh (1556-1605). For, aside from the monumental application of the octagon to some of the components of his imperial palace in Fatḥpūr – the « City of Triumph » which Akbar built in 1569 on the summit of a hill in Sīkrī and which served as his capital between 1574 and 1586 (such as the « Sangīn burdj » donjon and the « Hiran Minār » memorial) [226] or the octagonal pavilions

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[221] F. Gregorvius, « Castel del Monte, Castello degli Hohenstaufen in Puglia », in *Nelle Puglie*, Firenze 1882, 296. C. A. Willemsen, *Castel del Monte, Die Krone Apuliens*, Wiesbaden 1955.

[222] W. Krönig, « Castel del Monte, Der Bau Friedrichs II », *Kunstchronik* IX, 1956, 286.

[223] W. Cohn, *L'Età degli Hohenstaufen in Sicilia*, Catania 1932.

[224] R. Krautheimer, *ibid.*, 11, 29; for the symbolism of the numeral « 8 » in the Ambrosian theology and ritual, see d'Angelis d'Ossat, *Origine* etc. Arte Lombarda XIV, 1969, 1, 4 plus notes p. 6.

[225] An attempt at a typological schematic survey of Friedrich II forts in southern Italy and Sicily is made by G. Samonā, ibid., 507-518.

[226] E. W. Smith, *Archaeological Survey of India*: *The Moghul Architecture of Fatḥpūr-Sīkrī*, I, 1894, xviii; III, 1897, 34 + Pl. LVI, 36-37 + pls. LVIII, LXII.

in the corner towers of his mausoleum in Sikandarah (Agra) [227] – Anderson [228] found a strange similarity between the resolve of Friedrich and Akbar to integrate different religions and philosophies, in their aspiration for international rule and their quest after war, the chase, poetry, science, the arts and the crafts. In both instances, moreover, the architecture evolved from the combination of different and seemingly contradictory influences, harmoniously compounded and crystallized into new styles. However, beyond these general statements, which, being based a priori on a weak equation of time and space, might have encompassed also the personality and enterprises of Qānṣūh al-Ghawrī [229], it would appear that the instance of the Dome of the Rock is more relevant. The preference given here to Islam's first (691) major Islamic monument is not intended to stress the influence of Muslim architecture on the Friedrichian design (the influence really calls for careful study [230]; at any rate, its practical application was also manifest in India) [231], but rather to suggest that the Dome of the Rock was a kind of connecting link between Castel del Monte and Qal'at al-Ṭīna. However, in the herein context, this circumstantial situation is a matter more of methodology than genetics; just, as, on the one hand, we cannot identify the Dome of the Rock as a clear and distinct model for the Castel, so the Castel cannot be a clear and distinct model for the qal'a. On the other hand, the clear and distinct similarity in the plan of the Dome of the Rock and the qal'a is decisive for the present attempt to interpret the work of Qānṣūh al-Ghawrī in Ṭīna.

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227 E. W. Smith, ASI, *ibid.*, *XXXV*: *Akbar's Tomb*, Sikandara/Agra Allahabad 1909, 12 + pl. III.

228 W. Anderson, *Castles of Europe*, London 1970, 177.

229 This is not the place to outline the complex character lines of his biography, in the spheres of politics, religion and culture; for the last, see in the meantime *'Abd al-Wahāb 'Azzām*, *Madjālis al-Sulṭān al-Ghawrī*, Cairo 1941, 38 ff; M. 'Awād, « Sultan al-Ghawri, His Place in Litterature and Learning », *Actes du XXeme Congrès Internationale des Orientalistes*, Bruxelles, September 5–10, 1938, Louvain 1940, 321–322.

230 See the comments by G. Zander, « Un Curioso Marginale Errore Critico sull'Architettura Federiciana », *Palladio*, n.s. XVIII, 1968, 51–54 (cf. S. Bottari, « Intorno alle Origini dell'Architettura Sveva nell'Italia Meridionale, ed in Sicilia », *Palladio*, 1951–1952, 30) and of V. Strika about the doubtful Ummayad influence on Friedrich's other forts: « Intorno all'Ipotesi ' Ommiade ' dei Castelli di Federico II », AIOUN XXXIII/4, 1973, 594–602. Essentially, one should not overlook the Emperor's ambivalent attitude toward the Islam: F. Gabrieli, « Frederick II and Moslem Culture », *East and West*, Rome 1958, 54 ff.; on the other hand, see the interpretation of d'Angelis d'Ossat of Castel Maniace: « Lettura di Castel Maniace: Una Moschea Federiciana a Siracusa », *Palladio*, XVIII/1–4, 1968, 55–60.

231 For the influence of the Dome of the Rock on the octagonal mausoleum of Tilangāni in Dilhi (1368), see M. Z. Hasan, « A Guide to Nizam-ud-Din », *Memoir ASI* X, Calcutta 1972.

(C) Indeed, as in the case of Castel del Monte, the perfect octagonal plan of the qal'a demonstrates its dual functional and ideological coherence: a military fort, which, simultaneously if not primarily, fills an imperial mission. This mission may apparently be elucidated through its affinity to the Dome of the Rock.

1) In Oleg Grabar's [232] authoritative analysis of the location of the Dome of the Rock in the Jerusalem's Ḥaram – as of its plan, ornamentations and Inscriptions – he emphasizes the presence, in its erection, of two major themes: on the one hand, its being evaluated, a priori, as significant in its relationship with Christianity and Judaism; on the other, its being of significance to the Islam. Without restorting here to specific considerations, the main realization in its erection (as its inscriptions explicitly indicate) was the position of the new faith and the new state founded upon it. In other words, the Dome fo the Rock manifested the conscious realization of the status of Umayyad rule, vis-a-vis the traditional successor to the Roman Empire: in this Christian city, par excellence, in the 7th Century, 'Abd al-Malik sought to establish his presence and to confirm the triumph and superiority of the Islam. Indeed, this confirmation characteristically implying a zealous missionary invitation to accept the new faith, expressed both in its inscriptions as in its royal Byzantine and Sassanid symbols (designed in its mosaics as crowns and jewels) and also – primarily – in the appropriation of the ancient site of Mount Moriah. In other words, the emplacement and erection of the Dome of the Rock as *prise de possession* [233] of a sacred site, was nothing less than the dispossession of the Christian vision and the islamization of the Jewish Temple Mount. From this standpoint, according to Grabar, the Edifice should be associated not with the monuments which influenced its formal design but rather with the general practice of establishing the symbol of the conquering power in the conquered land. The formal terms used in expressing this symbolic appropriation were borrowed from the Byzantine and Sassanid art vocabulary and implemented through the conscious process of their islamization. Other than the Muslim overtones, apparent in the erection of the Dome of the Rock, its purpose was to serve as a monument for the non-Muslims, for with all the Muslim ramifications of its symbolism, it was an immanent structure which served definitely contemporary needs, of which the foremost was to prove to the Christian and Jewish worlds that the Islam was the ultimate and true successor to their religions, and that the Islamic state had come into possession of their holiest city.

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232 « The Ummayad Dome of the Rock », *Ars Orientalis* III, 1959, 33–62.

233 O. Grabar, *The Formation of Islamic Art*, New Haven-London 1973, 66.

2) Hence, despite the different historical connotations, the significance of the qal'a might emerge more clearly through a similar application of ideas or considerations.

a) The first consideration that may thus be assumed is therefore the Sulṭān's conscious attempt to establish the physical presence of his sultanate, and at the same time to confirm its power, symbolically. From this point, the purpose of the monument would seem to be twofold: outwardly, the defense of the Muslim state against the Christian foe; internally, the defense of the Muslim state against the Muslim foe.

b) A second consideration would apparently concern the choice of the site. For above and beyond the obvious strategic features – coastal defense on the one hand and the overland route on the other – it is higly questionable whether they alone, or in themselves, dictated the specific location of the qal'a. This question is of special significance in view of two facts: first, the qal'a's tactical shortcomings, in covering the open and desolate territory surrounding it; secondly, its erection close to Pelusium. Ṭīna's affinity to Pelusium might be explained by three factors: first, the most plausible (though not certain) – the continued use of the ancient Pelusiac port, secondly, more speculative (but not invalid) – the ancient residual conception of Pelusium as Egypt's eastern gate. While Ṭīna does not fill this role historically, might is not be that symbolical Ṭīna served as such? In other words, would it not be that the echo of this conception might still have existed in the days of Qānṣūh al-Ghawrī? If the validity of such association could be established, then the location could claim for itself a symbolic territorial significance, as the « battleground » of the state, in the attempt to evade its approaching end, already begun. The third factor, the most important and interesting (from the Muslim viewpoint) would ascribe to Ṭīna's location a significance both physical and metaphysical: as a concrete and symbolic representation of the Quranic *madjma' al-Baḥrayn* and the *Barzakh* (XVIII, 60 and 53; LV, 19), for while the « juncture of the two seas » was conceived by some *Tafsīr* writers [234] as the *idjtimā'* of the Persian Ocean (= Indian Ocean, via the Red Sea) with the Mediterranean, the location of this junction had been generally designated by Islamic geographers and historians of the Middle Ages as being the isthmus

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[234] For Sura XVIII/60 cfr., for example, Bayḍāwī, *Anwār al-Tanzīl wa-Asrār al-Tāwīl*, ed. Fleischer 1968/1846–8, I 567, 1. 16; Ṭabarī, *Djāmi' al-Bayān fī Tafsīr al-Qurān*, Beirut ed., XV, 176; Nīsābūrī, *Tafsīr Gharā'ib al-Qurān*, *ibid.*, (on the margin) XVI, 5. Cf. Maqrīzī, *Khiṭaṭ I* (*Būlāq*), 28; Cf. also J. H. Kramers, *The Legacy of Islam*, ed. Arnold-Guillaume (Oxford 1931, 83) who ascribes the theory of the two seas to a Persian origin.

between al-Faramā and al-Qulzum (Suez)[235] or even – more specifically – near Faramā[236]; however, this last designation was finally redeemed from its vagueness by the contemporary and exclusive testimony (16th Century) of 'Abd al-Qādir al-Djazarī[237], who readily fixes the *idjtimā'* right in Ṭīna. He says: *Wa-qīla anna al-Iskandar ḥīna fataḥa Bāb al-Mandab wa-waṣala fī al-baḥr* [the Red Sea] *ilā al-Ḥidjāz ilā an awṣalahu bi'l-Sūes arāda ḥafr hādhihi al-djūar* [in the district including *'Aqabat al-munṣaraf*][238] *li-yamshīya al-baḥr* [the Red Sea] *wa-yūṣilahu bil-Ṭīna fa-yakhtaliṭu ma'a al-baḥr al-Shāmī lākin khashīya dukhūl al-Firandj fa-a'raḍa 'an dhālika.*

Indeed, the importance of this statement lies not only in its determination, in principle, of the juncture of the two seas in Ṭīna, but also in its ascribing the juncture project to Alexander. Above and beyond the matter of his identity, historical and/or legendary, the significance of Alexander the Great, in the herein context, might be twofold: on the one hand, his characteristic integration – as changing the world order – in the Muslim framework of that classical theme, which deals with the potential junction and executor of the two seas project[239], by a kind of « Suez ca-

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235 Cf. for example, Muqaddasī, *Aḥsan al-Taqāsīm fī Ma'rifat al-Aqālīm*, BGA III, Leiden 1967, 16, Mas'ūdī, *Tanbīh* (BGA, VIII Leiden 1894), 20. Ibn Taghrībirdī, *Nudjūm*, Cairo 1963, I, 43. Maqrīzī, *Khiṭaṭ I* (*Būlāq*), 28. Regarding the fixing of the location of al-Qulzum at the end of « baḥr Fārs », which is itself connected with the « eastern muḥīṭ » (= Indian Ocean) as well as the designation of the « masāfa » between it and the Mediterranean as « ḥiṣn al-Tīh » see Ibn al « Wardī, *Kharīdat al 'Adjā'ib fī Farīdat al-Gharā'ib*, Būlāq, n.d., 22. See also J. J. Le Père, « Mémoire sur la Communication de la Mer des Indes a la Mediterranée », DE XI, 1822, 144–146.

236 See Abū al-Fidā', *Taqwīm al-Buldān*, Paris 1848, II/1, 146; Ibn Duqmāq, *Intiṣār*, V, 53; Le Père, *ibid.*, 369–370.

237 See *Durar al-Fawā'id al-Munaẓẓama fī Akhbār al-Ḥādjdj wa-Ṭarīq Makka al-Mu'aẓẓama*, Cairo 1964, 486.

238 Regarding this dig at 'Aqabat al-Munṣaraf in Sinai, cf. also Ḥādjdjī Khalīfa, *Djihān Numā*, in J. Von Hammer, « Pilgerstrasse von Kairo nach Mekka », *Jahrbücher der Literatur*, Wien 1840, 92, 48.

239 Cf. for example on the one hand, Abū al-Fidā''s version (*ibid.*, 146) regarding Amrū b. al-'Āṣ, and, on the other, Mas'ūdī's version (*Murūdj*, Paris 1914, IV, 97–99) regarding Hārūn al-Rashīd; these two versions, along with a third – which associates the enterprise with « one of the Yemenite kings » and explains its non-performance on the grounds of differences in the levels of the Red Sea and the Mediterranean – are discussed by Abū 'Ubayd al-Bakrī. *Al-Mamālik wal-Masālik*, Paris MS. 5905, fol. 81A B. Indeed, as against the general predominance – during the entire ancient period, through the Middle Ages and down to the end of the 18th Century – of the thesis, which explains the incompletion of the digging of the canal as due to the higher level of the Red Sea, most of the Arab sources offer an entirely different consideration: the fear of Christian-Byzantine or Crusader penetration into the Red Sea and its threat to the holy cities in the Ḥidjāz; cf. also J. E. Goby, « Histoire des Nivellements de l'Isthme de Suez », BSEHGIS IV, 1951–1952, 101–169, 105 ff., 112 ff.

nal »[240]; on the other hand, his common conception in the eclectic Muslim tradition as Dhū al-Qarnayn or as al-Khaḍir[241], discoverer of the Fountain of Immortality. To the extent that the two metaphors – of Madjma' al-Baḥrayn and al-Barzakh – point to Ṭīna, its cosmic significance becomes clear: it represents not only the « terminus of the West » or even the edge of the world and the juncture point of the oceans of heaven and earth[242], the spot of the source of life and the Fountain of Immortality[243], but also its being the breaking point, so to speak, of the « buffer », separating paradise from hell[244],

The extent of Qānṣūh al-Ghawrī's himself also designated as Iskandar

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240 For the literary and cartographic documentation of the « Suez Canal », connecting Suez with Pelusium-Ṭīna, see A. L. Fontaine, *Monographie Cartographique*, xiii-xvi, 99 ff.; Le Pere, *ibid.*, 53, 104-105.

241 Cf. I. Friedlaender, *Die Khadir Legende und der Alexanderoman*, Leipzig 1913; Abel, *Le Roman d'Alexandre Legendaire Médiéval*, Bruxelles 1955, 56 ff., 78, 80 ff. According to Th'ālabī's version (Abel, *ibid.*, 80) when Dhū al-Qarnayn reached the « Source of Life » he found a fortress there (one should perhaps be made aware of the possible relationship between this fortress and Qal'at al-Ṭīna). In this connection it is of interest to mention the lofty fortress at Diyār Bakr in northern Djazīra, known, according to Ibn Ḥauqal (Al-Masālik wal-Mamālik, BGA II, Leiden 1873, 131), by the name « *Ḥiṣn dhū al-Qarnayn* »; for indeed, not only was there found, according to a tradition mentioned by Yāqūt (*M'udjam*, Wüstenfeld edition, Leipzig 1867, II 552) the source of the lower Zāb, but, even more, actually beneath it the outflow of the Tigris (for the actual outlet of the Didijla see EI² II, 256). For this source of the Tigris, Cf. also Mas'ūdī, Tanbīh (Beyrouth 1965) 52 and Abū al-Fidā', Taqwīm, 53.

242 Cf. A. J. Wensinck, « Bird and Tree as Cosmological Symbols in Western Asia », *Verh. Ak.* Amsterdam 1921, 17 ff. Indeed, we can understand, against this background, the explication – surprising in itself – of Khalīl b. Shāhīn al-Ẓāhirī, which locates Ṭīna on the shore of *al-baḥr al-muḥīṭ* (see n. 21 above). This is to say, that beyond the definition of the *muḥīt* as the sea encompassing the entire inhabited world (cf. for example, Mas'ūdī, *Tanbīh*, 26) or as the seventh sea circumscribing the marine system surrounding the earth (cf. for example, Qazwīnī, *Cosmography*, ed. Wüstenfeld, I, 104), the Arab geographers defined the main seas as the arms of the *muḥīṭ*. These arms, moreover, were conceived as forming two systems – the eastern and the western – meeting at the Isthmus of Suez (cf., for example, Yāqūt, *Mu'djam*, I, 504).

243 A. Abel, *ibid.*, 79-80.

244 For this interpretation of the Barzakh, as of others besides, see Carra de Vaux EI² (s.v.). The location of Qal'at al-Ṭīna in the paradaisic context may also be based on the interpretation by Abū al-Ḥasan Muqātil (d. 150/767), *al-Tafsīr fī Mutashābih al-Qurān*, Istānbūl, Serai Aḥmet III 74/2 (fol. 43 B) of the latter part of the Quranic verse XXV, 11: *wayadj'al lakā quṣūran* as Buyūtan *fī al-djanna wa-dhālika anna Qurayshan yusammūn buyūt al Ṭīn al-quṣūr*. In other words, to the extent that the *quṣūr* point to fortified structures, they are understood in this old syllogism (albeit not necessraily agreed upon; for a contrary version, see, for example, Ṭabarī, *Djāmi' al-Bayān*, XVIII, 139-140) as paradaisic structures made of clay. I wish to thank Prof. M. J. Kister for drawing my attention to the Muqātil quotation.

al-Zamān [245] awareness of this complicated conception of Ṭīna, as well as his conscious implementation thereof in his erection of the qal'a, is obviously a hypothesis which must have further confirmation and corroboration. However, the very fact of its existence – tangible or nebulous – in the late Mamlūk period (as Djazarī's statement indicates) may point to the unique and peculiar character of its location, suitable to the choice and erection of a peculiar and unique qal'a. This leads us to our third consideration:

c) This consideration, aligned with its two predecessors in that it implements them, is the selection of a specific formal terminology, borrowed from the military architectural vocabulary. The choice of the qal'a itself may therefore be explained in three parallel and complementary ways: firstly, the qal'a served as a military monument, an eminent symbol of the Mamlūk military state [246]; moreover, its construction – stone foundation and brick superstructure – was not necessarily an exhibit of the continued Umayyad tradition of fortifications [247], but rather of the significance attached in monumental Mamlūk architecture to the use of stone: power and grandeur, solidity and durability, wealth and expertise [248]. Secondly, to the extent that the qal'a represented Mamlūk rule and power, so was it grasped – against the background of the military conflict – by its opponents. Thirdly, because of its unique octagonal design, it was likely to symbolize not only the concept of the Sultanate but also, if not primarily, its eternality. Thus it is possible to explain the qal'a as an edifice which fulfilled idefinitive contemporary functions: beyond its immediate military function t was also intended to prove to the enemies of the state, Christian and/or Muslim, that its days were not over, and that he who might be regarded as its last sulṭān was really the one who would improve, continue and enhance it. Such an imperial mission was probably contemplated by Qānṣūh al-Ghawrī when he conceived of and perhaps planned [249] Qal'at al-Ṭīna.

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[245] Regarding this attribute of the Sulṭān (albeit in an indirect version) see 'Abd al-Laṭīf Ibrāhīm, *al-tauthīqāt al-Shar'iyya fī Ẓāhr Wathīqat al-Ghawrī*, 883, Wizārat al-Awqāf, al-Qāhira 1960, 342. 1. 8 above. Regarding the frequency (generally in inscriptions) of this attribute among previous Mamlūk sulṭāns, cf., for example, the case of Baybars (QDAP, II, 1933, 28/E, 32), al-Ashraf Khalīl (REA, XIII, 107, no. 4957), al-Nāṣir Muḥammad (Ibn-Faḍlallāh al-'Umarī, *Masālik al-Abṣār*, 6); cf. also in the case of the Mongolian Ilkhān Uldjaytū), REA XIV, 80, no. 5328.

[246] R. S. Humphreys, « The Expressive Intent of the Mamluk Architecture of Cairo », *Studia Islamica*, XXXV, 1972, 87.

[247] H. Stern, « Notes sur l'Architecture des Châteaux Omeyyades », *Ars Islamica*, XI-XII, 1946, 87, 93.

[248] R. S. Humphreys, *ibid.*, 99.

[249] To the extent that the qal'a's plan emanated from the Sulṭān's creative genius, it

d) Only by a complicated explication such as this one can, apparently, explain the singularity of Qal'at al-Ṭīna. This manifest, without doubt, not only in the context of the Sulṭān's manifold and intensive building projects [250] but also in the history of Muslim military architecture. Such, in other words, were those unique geo-historical and cosmographic circumstances which gave birth to a unique architectural phenomenon [251]. This singularity, understood perhaps in its own generation, lost its motivation and mission and disappeared from memory. There is, therefore, something ironic in the fact that, during its entire history, the qal'a was spared the destructive fate of a battleground, remaining as a kind of a memorial,

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adds another marvellous dimension to his intellectual profile. Quite instructive, in this context, is the introduction by Ḥusayn b. Muḥammad al-Ḥusaynī to *Kitāb Nafā'is Madjālis al-Sulṭāniyya fī Ḥaqā'iq Asrār al-Qurāniyya* on the universal acceptance and the vitality which science held for the sovereign; the very inclusion of Qānṣūh al-Ghawrī among the « enlightened » royal family of world sovereigns is obviously another significant aspect of his reign and personality; see 'Abd al-Wahāb 'Azzām, *ibid.*, *Nafā'is Madjālis al-Sulṭāniyya*. Regarding the relationship between the creative role of the patron (Amīr or Sulṭān) in Mamlūk society and the technical, supervisory and executive role of the architect, see also Humphreys, *ibid.*, 78–79. As for the identity of the architect in the case under discussion, it may be that, despite his anonymity (characteristic not only in Muslim architecture but also – according to L. A. Maggiorotti, *Architetti e Architetture Militari*, 95 – to military architecture in the Middle Ages), he was none other but Khā'īr Bak; cf. E. Combe, *Le Fort Qaytbay à Rosette*, *ibid.*, 5.

[250] For the architectural enterprises of Qānṣūh al-Ghawrī, see Sh. Tamari, « An Inscription of Qānṣūh al-Ghawrī from 'aqabat al-'Urqūb », *Atti della Accademia Nazionale dei Lincei*, XXVI, 1971, 175 + Tav. 1. To the sources mentioed, there should be added Ibn Abī al-Surūr al-Bakrī al-Ṣidīqī, *Nuzhat al-Abṣār wa-Djahīnat al-Akhbār*, Paris MS. 1561, fol. 121 B. In this connection, the statement by al-Ḥusaynī (*Nafā'is al-Madjālis*, 127) is instructive: *wa-min 'adjā'ib dawlatihi 'imārāt kathīra fī mudda yasīra 'amila fī-sitta sinīn alladhī la yumkin mithluhu fī sittīn*! Indeed, the subsequent association of this time span with the one identical with the building of the pyramids adds a kind of mythical dimension to his enterprises. In the same context it is interesting to note the Sulṭān's « erudite » (albeit unhistorical) answer regarding the identity of the builders of the pyramids and their intention thereby: *al-Kaukab al-Durrī fī Masā'il al-Ghawrī*, *ibid.*, 54–62. For Qānṣūh al-Ghawrī's symbolical interpretation of another engineering project, see Sh. Tamari–A. Hashimshoni, « The Hewn Passage in 'Aqabat al-'Urqūb », *Eretz-Israel* (Heb.), 11, 1973, 290–293.

[251] In connection with Djalāl al-Dīn's hexagonal fort, Pope (*A Survey of Persian Art*, III, 1241) emphasized the rarity of the polygonal fortress in the Iranian military architecture; regarding the erection of this undated (Ṣafwafīd) fort, on a rise of about 45 meters, with six round, two-storied towers, see E. Diez, *Churaschaniche Baudenkmaler*, Berlin 1918 I, 15 + Abb. 6. Perhaps also of interest is the fact that the same Timur Bāy al-Hindī, who was put in charge by Qānṣūh al-Ghawrī of building Ṭīna II (= 1508–1509), was sent by him later (apparently in 1510) to Shāh Ismā'īl (1502–1524), the founder of the Ṣafawīd dynasty in Persia; see Maḥmūd Rizq Salīm, *'Aṣr Salāṭīn al-Mamālīk*, Cairo 1965, II, 215, 229.

mute in its desolation but tangible and even dramatic in the almost surrealist landscape of its location, a « memorial » whose primary connotations faded and were never resurrected, not only by its later viewers and successors, nor even by the chronists of its period (who generally ignored it) [252]. Indeed, even from this associative standpoint, Qal'at al-Ṭīna demonstrated its unique similarity to the Dome of the Rock [253].

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[252] For the Muslim chronists who mentioned the Sulṭān's edifices, see Tamari, *ibid.*, 175, n. 12.

[253] O. Grabar, *The Formation of Islamic Art*, 74.

ABBREVIATIONS

Ibn Iyās, *Badā'i'* = Muḥammad b. Aḥmad b. Iyās, *Badā'i' al-Zuhūr fī Waqā'i' al-Duhūr*, IV, ed. Muḥammad Muṣṭafā, Cairo 1960; V, ed. Muḥammad Muṣṭafā, Cairo 1961.

Ibn Duqmāq, *Intiṣār* = Ibrāhīm b. Muḥammad b. Aydimir... Ibn Duqmāq, *al-Intiṣār li-Wāsiṭat 'Iqd al-Amṣār*; ed. Vollers, Le Caire 1893.

Ibn Taghrībirdī, *Ḥawādith* = Djamāl al-Dīn Abū al-Maḥāsin Yūsuf b. Taghrībirdī, *Ḥawādith al-Duhūr fī Madā al-Ayyām wal-Shuhūr*, ed. W. Popper, University of California Publications in Semitic Philology, VIII, 1930–1942.

Ibn Taghrībirdī, *Nudjūm* = *al-Nudjūm al-Zāhira fi Mulūk Miṣr wal-Qāhira*, I, Cairo 1963; XIV, ed. Muḥriz-Shaltūt, Cairo 1972; VXI, ed. Shayyāl-Shaltūt, Cairo 1973.

Ayalon, *Gunpowder* = D. Ayalon, *Gunpowder and Firearms in the Mamluk Kingdom*; *A Challenge to a Mediaeval Society*, London 1956.

Ayalon, *The Mamluks and Naval Power* = D. Ayalon, *The Mamluks, A Phase of the Struggle between Islam and Christian Europe*; The Israel Academy of Sciences and Humanities, Proceedings I, 8, Jerusalem 1965.

Baghdādī, *Marāṣid* = Ṣafī al-Dīn 'Abd al-Mu'min b. Abd Isḥāq al-Baghdādī, *Marāṣid al-Ittilā'alā Asmā' al-Amkina wal-Biqā'*; ed. al-Badjāwī, , 1955.

Djabarti, *'Adjā'ib* = 'Abd al-Raḥmān al-Djabartī, *'Adjā'ib al-Āthār fī al-Tarādjim wal-Akhbār*; I (Būlāq); IV (Būlāq).

DE = *Description de l'Égypte*, Imprimerie de V. L. F. Panckoucke, Paris.

Wiet, *L'Égypte Arabe* = G. Hanotaux, *Histoire de la Nation Égyptiénne* t. IV: G. Wiet, *L'Égypte Arabe*, Paris 1937.

Wiet, *Précis* = G. Wiet, *Précis de l'Histoire d'Égypte* II, IFAO 1922: *l'Égypte Musulmane*.

Al-Ẓāhirī, *Zubda* = Ghars al-Dīn Khalīl b. Shāhīn al-Ẓāhirī, *Zudbat Kashf al-Mamālik Wa-Bayān al-Ṭuruq wal-Masālik*; ed. Paul Ravaisse, Paris 1894.

Yāqūt, *Mu'djam* = Shihāb al-Dīn Abū 'Abdallāh Yāqūt b. 'Abdallāh al-Ḥamawī, *Mu'djam al-Buldān*, Beirut 1955–1957.

Mubārak, *Khiṭaṭ* = 'Alī Bāshā Mubārak, *al-Khiṭaṭ al-Tawfīqiyya al-Djadīda l-Miṣr al-Qāhira wa-Mudunuha wa-bilādiha al-Qadīma wal-Shahīra*; XIII, Būlāq 1305 A.H., XVI, Būlāq 1305 A.H.; XVIII, Būlāq 1306 A.H.

Mas'ūdī, *Murūdj* = Abū al-Ḥasan 'Alī b. al-Ḥusayn b. Alī al-Mas'ūdī, *Murūdj al-Dhahab wa-Ma'ādin al-Djawhar fī al-Ta'rikh*.

Maspero-Wiet, *Matériaux* = J. Maspero-G. Wiet, *Matériaux pour Servir à la Géographie de l'Égypte*, MIFAO 36, Le Caire 1919.

Maqrīzī, *Khiṭaṭ* = Taqī al-Dīn Aḥmad b. 'Alī b. 'Abd al-Qādir b. Muḥammad al-Maqrīzī' *al-Mawā'iẓ wal-I'tibār bi-Dhikr al-Khiṭaṭ wal-Āthār*; ed. Libanese n.d.; ed. Wiet, Cairo 1922.

Maqrīzī, *Sulūk* = *al-Sulūk li-Ma'rifat Duwal al-Mulūk*; ed. Muḥammad Muṣṭafā Ziyāda, I 1, Cairo 1964, I 2, Cairo 1936; I 3, Cairo 1939; II 2, Cairo 1936. ed. 'Abd al-Fatāḥ 'Āshūr, III 1, Cairo 1970; II 3, Cairo 1972; IV 1, Cairo 1972.

Suyūṭī, *Ḥusn* = Djalāl al-Dīn 'Abd al-Raḥmān al-Suyūṭī, *Ḥusn al-Muḥaḍara fī Ta'rikh Miṣr wal-Qāhira*.

Fontaine, *Monographie* = A. L. Fontaine, *Monographie Cartographique de l'Isthme de Suez, de la Péninsule du Sinai, du Nord de la Chaîne Arabique*; Memoires de la SEHGIS, t. II, Le Caire 1955.

Pīrī, *Baḥriye* = Pīrī Re'īs, *Kitābī Baḥriye*; Türk Tarihi Araştirma Kurumu Yayinlarindan: No. 2 Istanbul 1935.

Şayrafī, *Inbā'* = 'Alī b. Dawūd al-Djawharī al-Şayrafī, *Inbā' al-Haṣr bi-Abnā' al-'Aṣr*, ed. Ḥasan Ḥabashī, Cairo 1970.

AIOUN = Annali dell'Istituto Orientale Universitario di Napoli

ASAE = Annales du Service des Antiquités de l'Égypte

ASI = Archaeological Survey of India

ASP = Archivio Storico Pugliese

ASS = Archivio Storico Siracusano

ASV = Archivio di Stato, Venezia

BFA = Bulletin of the Faculty of Arts (University of Egypt, Cairo)

BIFAO = Bulletin de l'Institut Français d'Archéologie Orientale (du Caire)

BIICH = Bulletin de l'Institut Internationale des Châteaux Historiques

BISCAG = Bollettino dell'Istituto Storico e di Cultura dell'Arma del Genio

BS = Burgen und Schlösser

BSEHGIS = Bulletin de la Société d'Études Historiques et Géographiques de l'Isthme de Suez

BSOAS = Bulletin of the School of Oriental and African Studies

BSRGE = Bulletin de la Société Royale de Géographie d'Égypte

EI² = The Encyclopaedia of Islam, New Edition (Leiden-London)

EEF = The Egypt Exploration Fund

MIFAO = Mémoires publiés par les membres de l'Institut Français d'Archéologie Orientale (du Caire)

REA = Répertoire chronologique d'Epigraphie Arabe

ZDMG = Zeitschrift der Deutschen Morgenländischen Gesellschaft

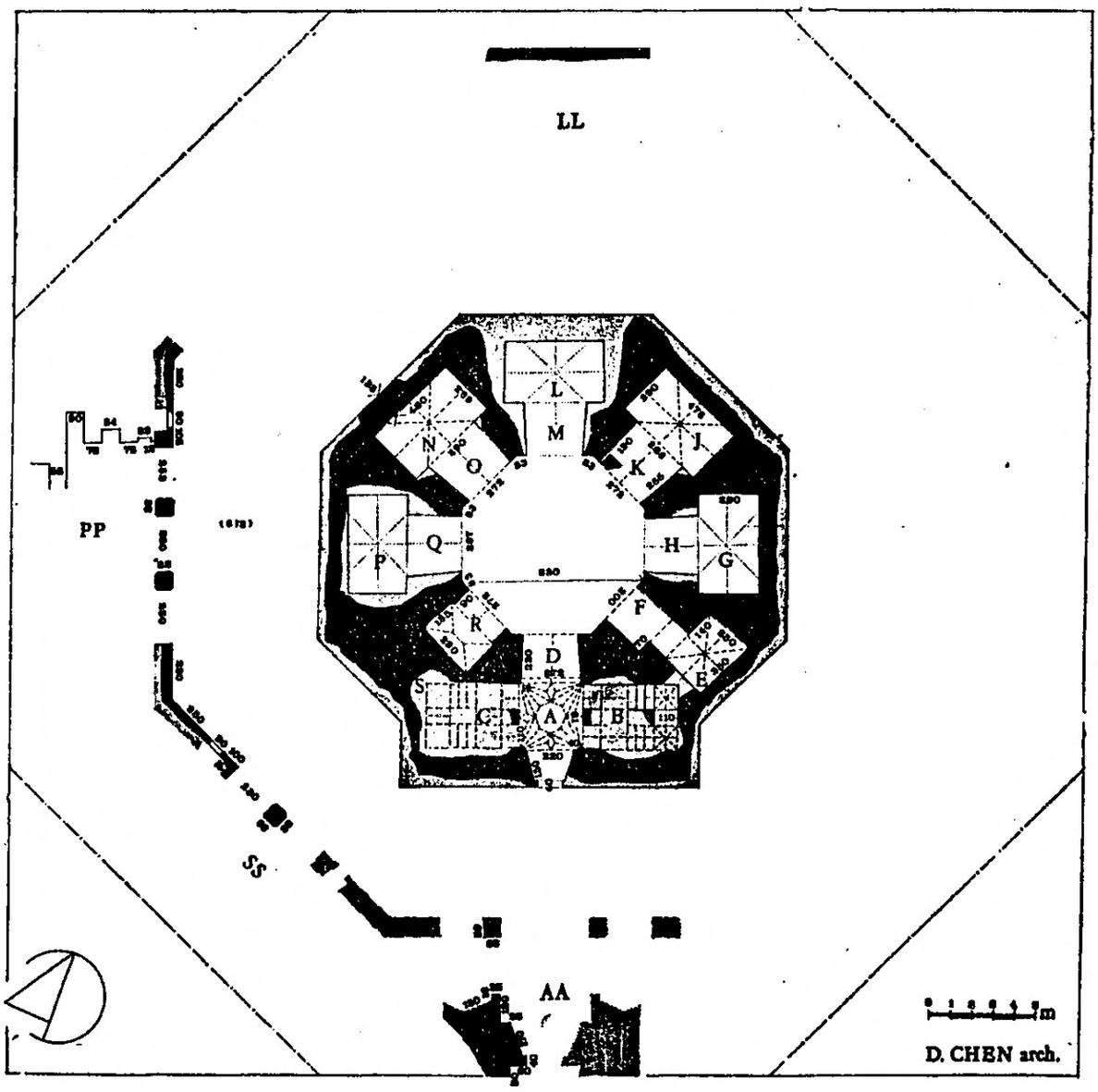


Fig. 1

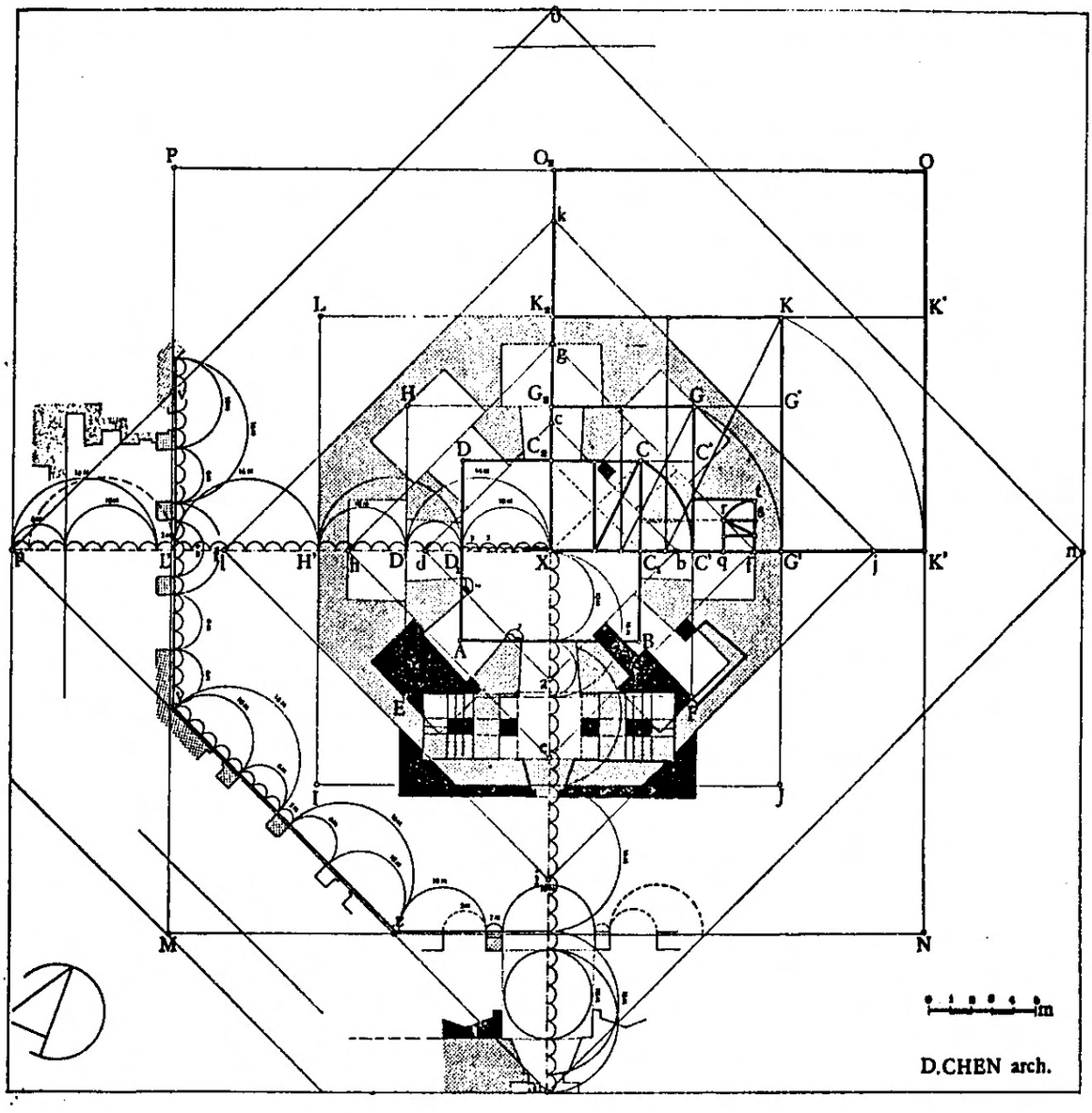
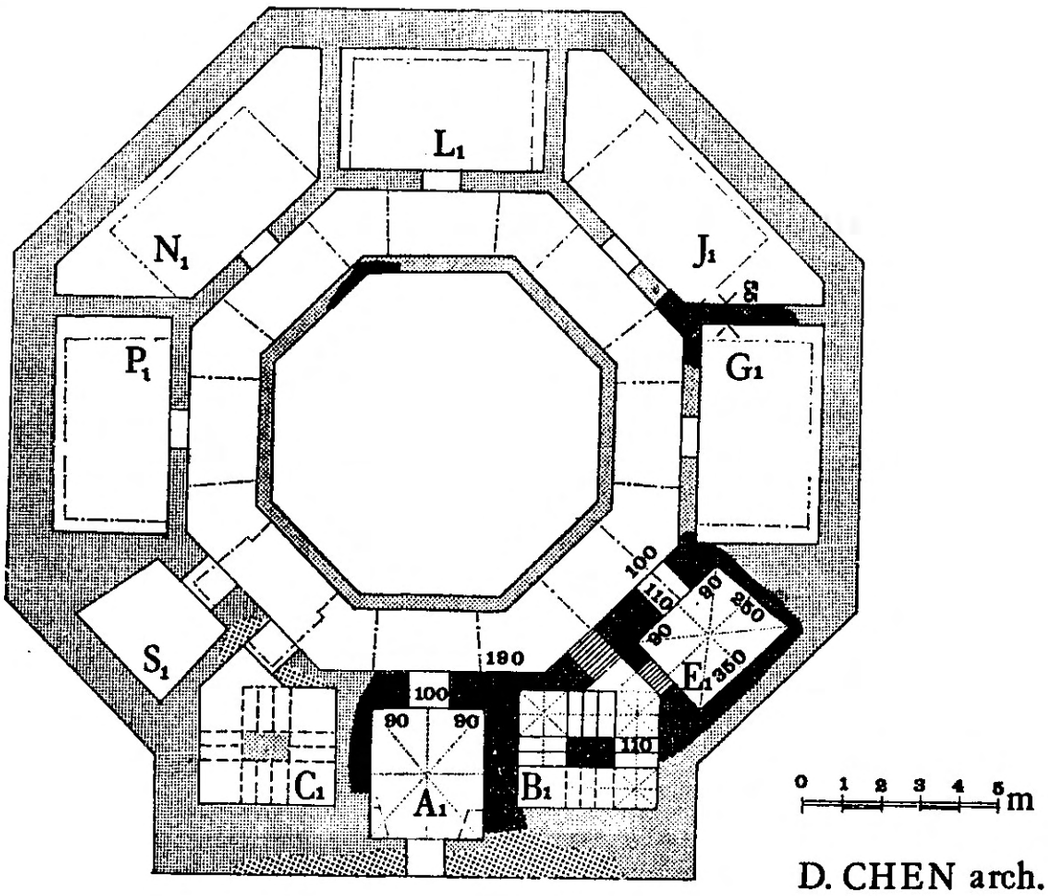


Fig. 2


L1
N1
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190
100
90
90
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0 1 2 3 4 5 m
D. CHEN arch.

Fig. 3

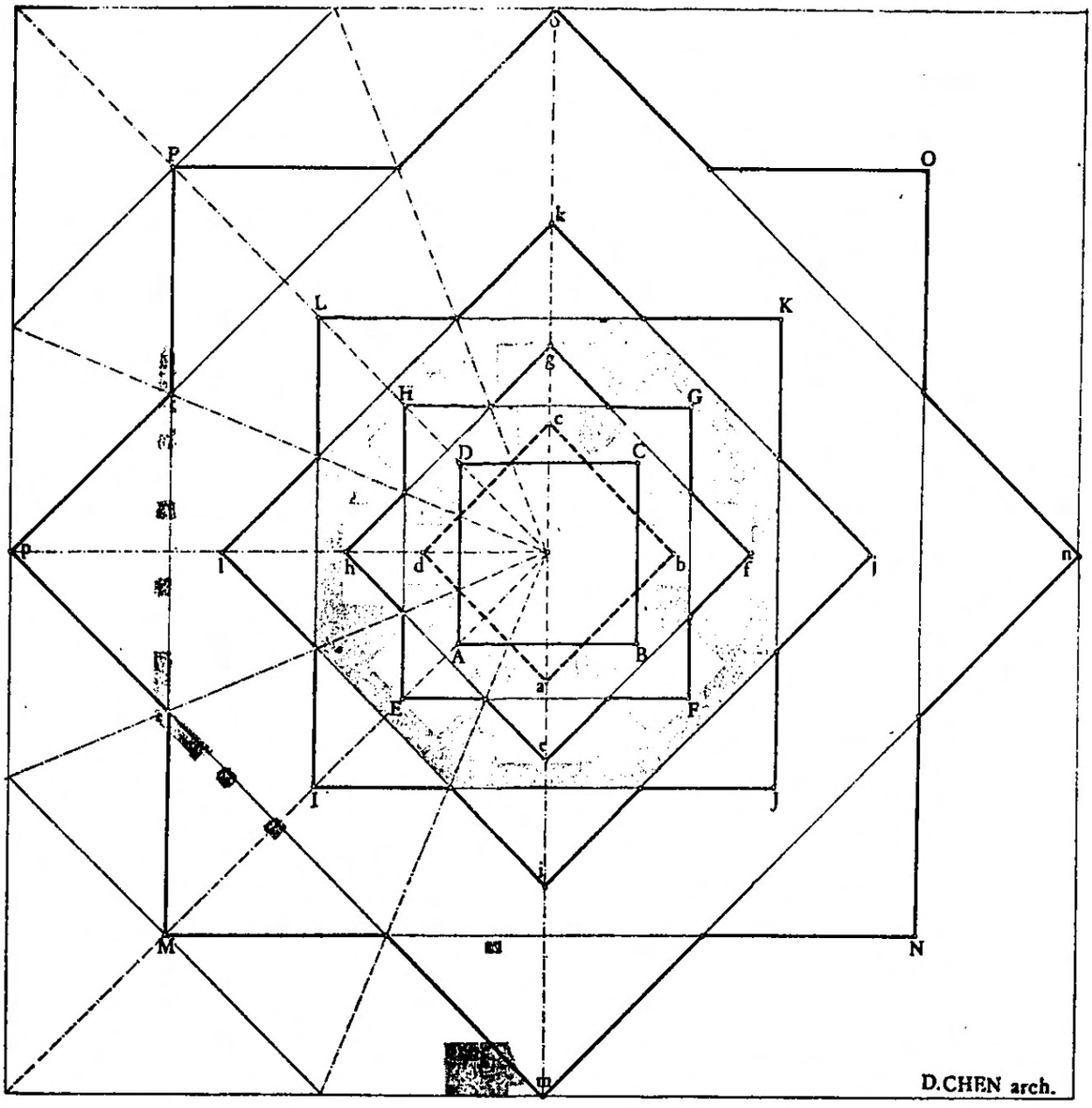


Fig. 4

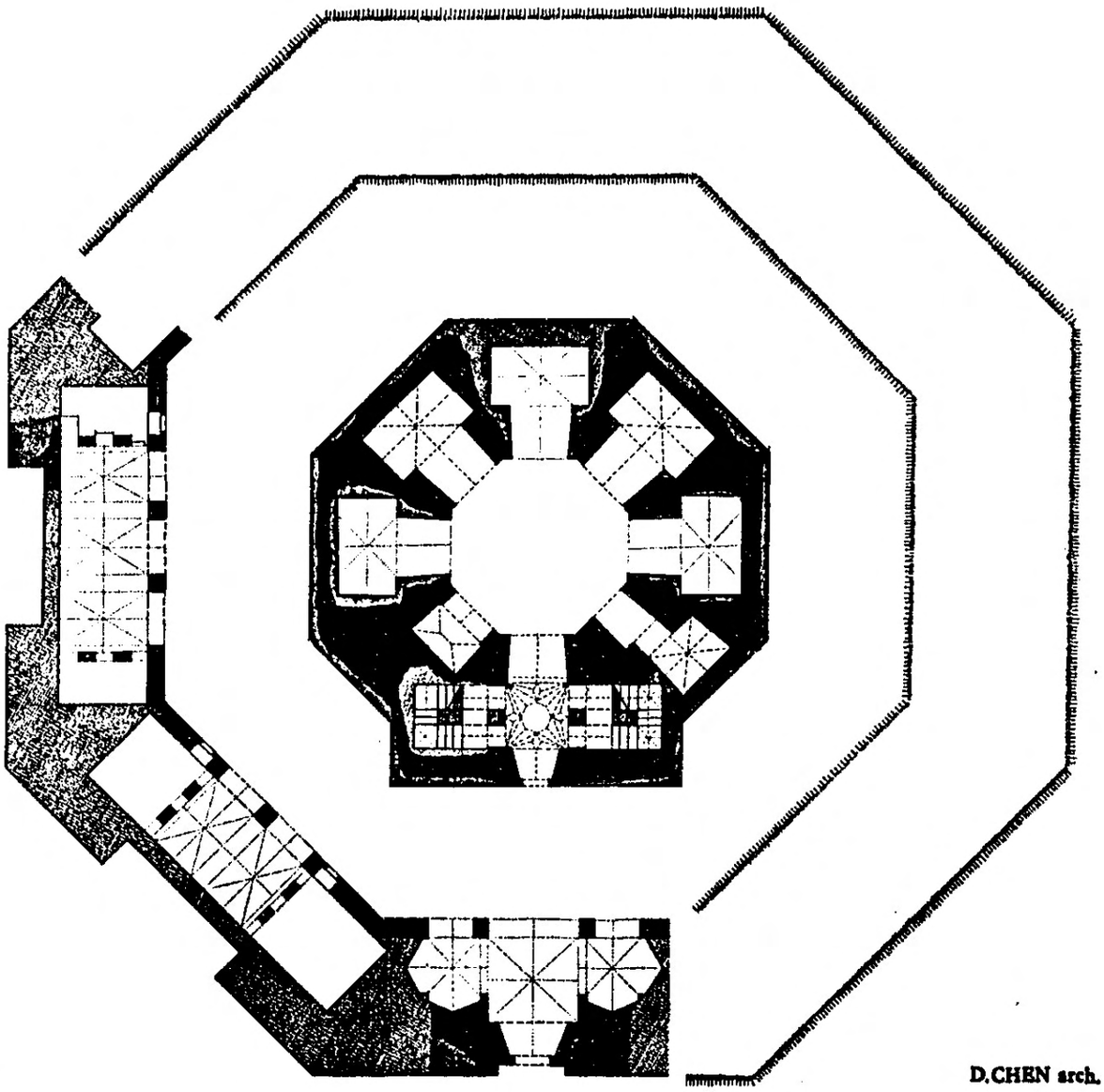
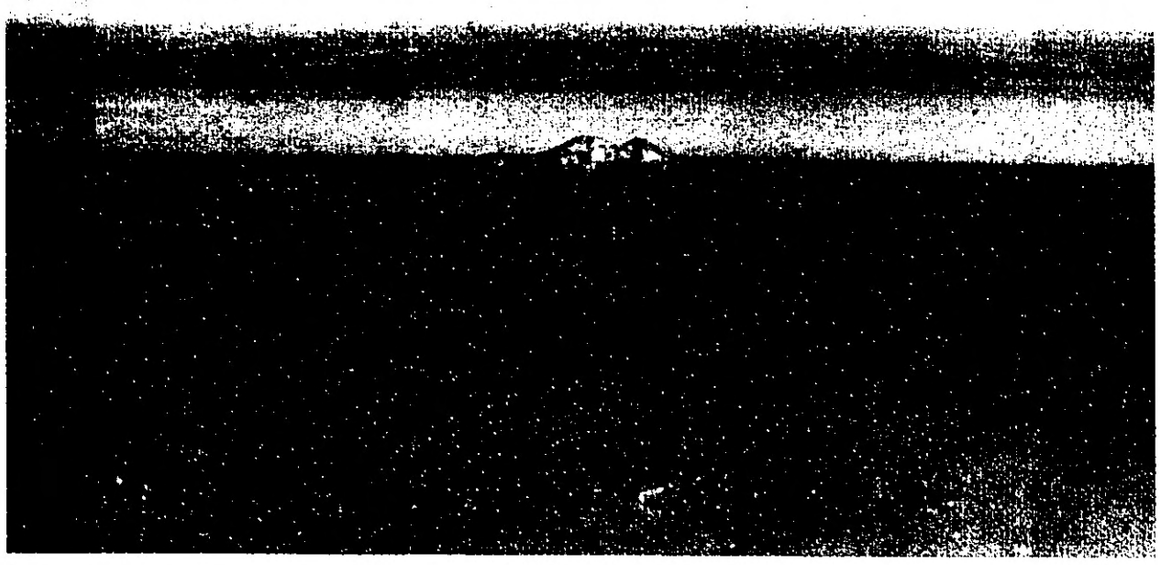


Fig. 5

PLATES



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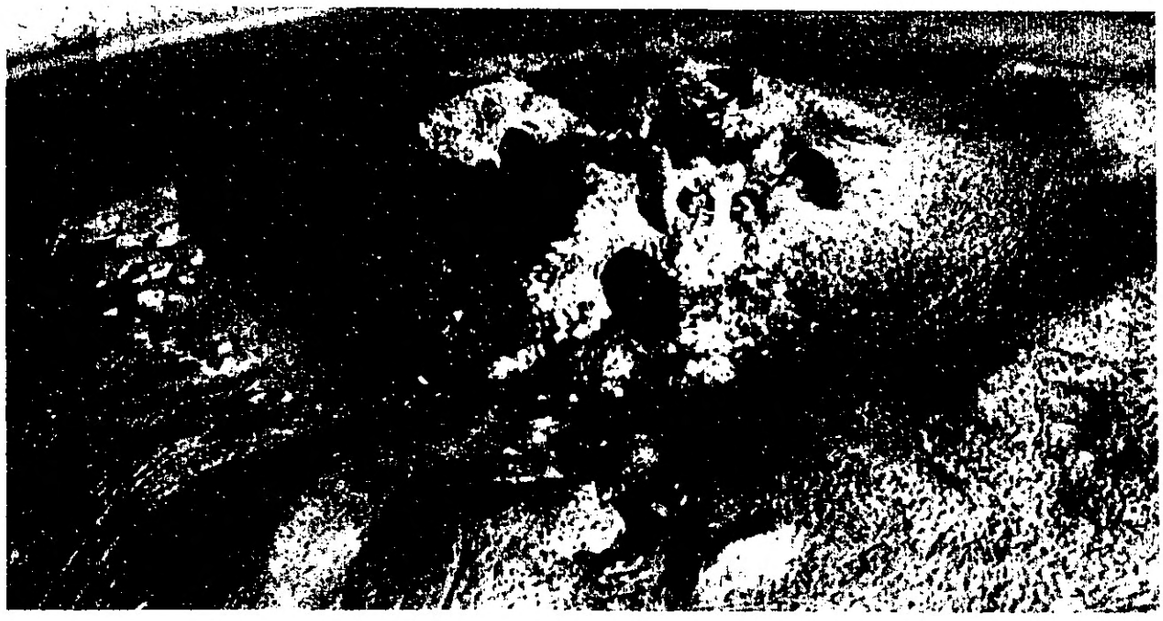
b



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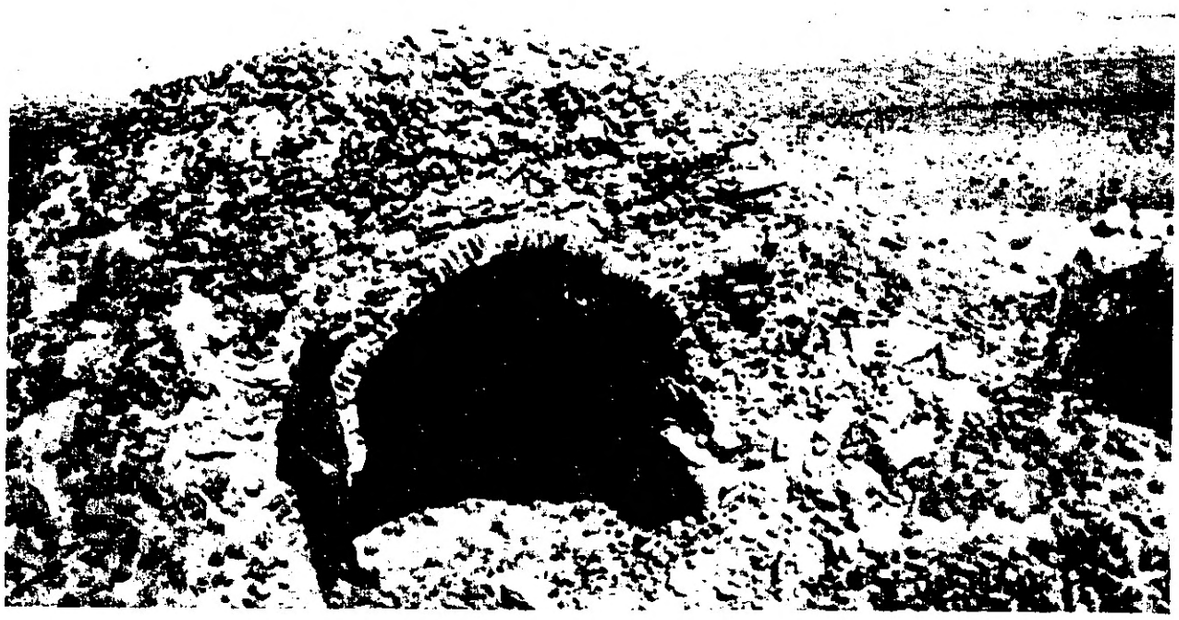

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c

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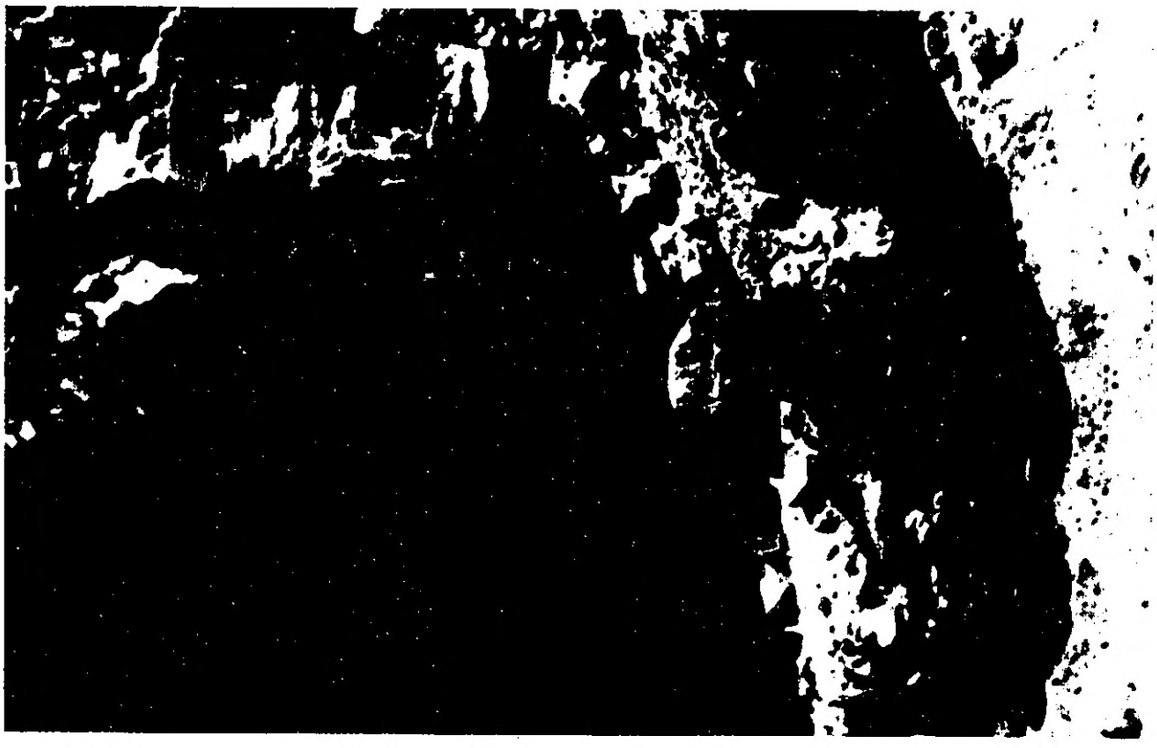


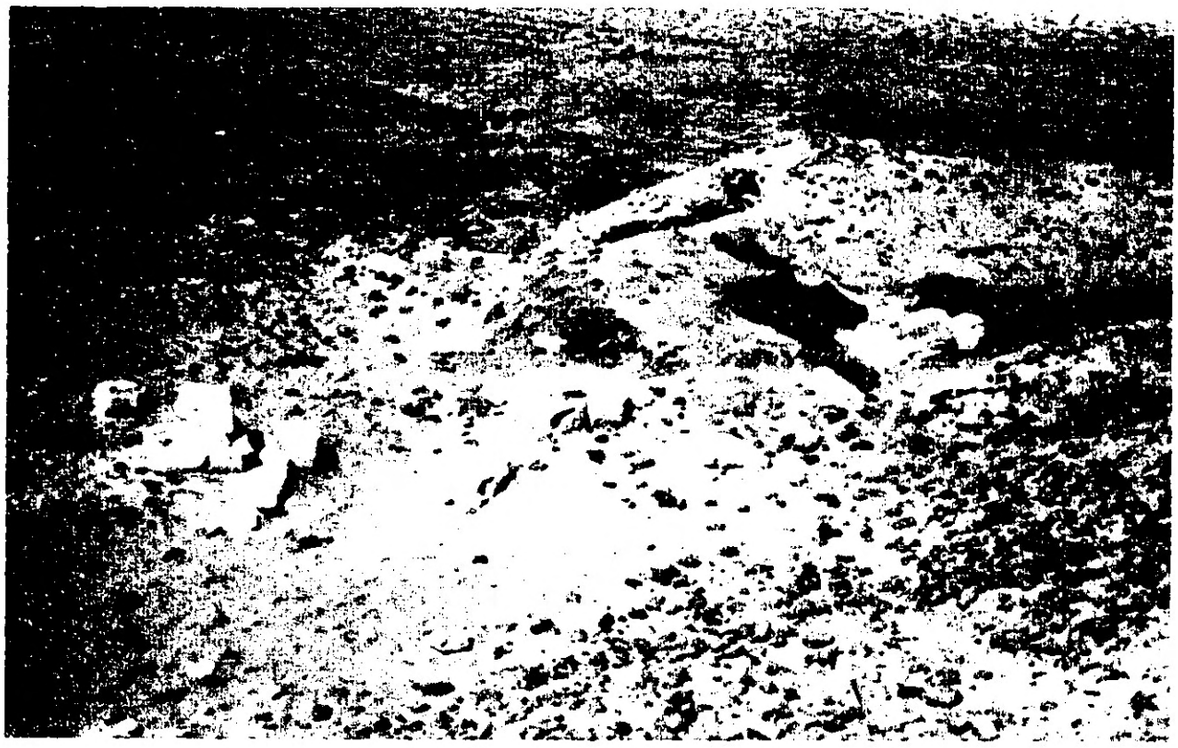
a

b

a

a

b



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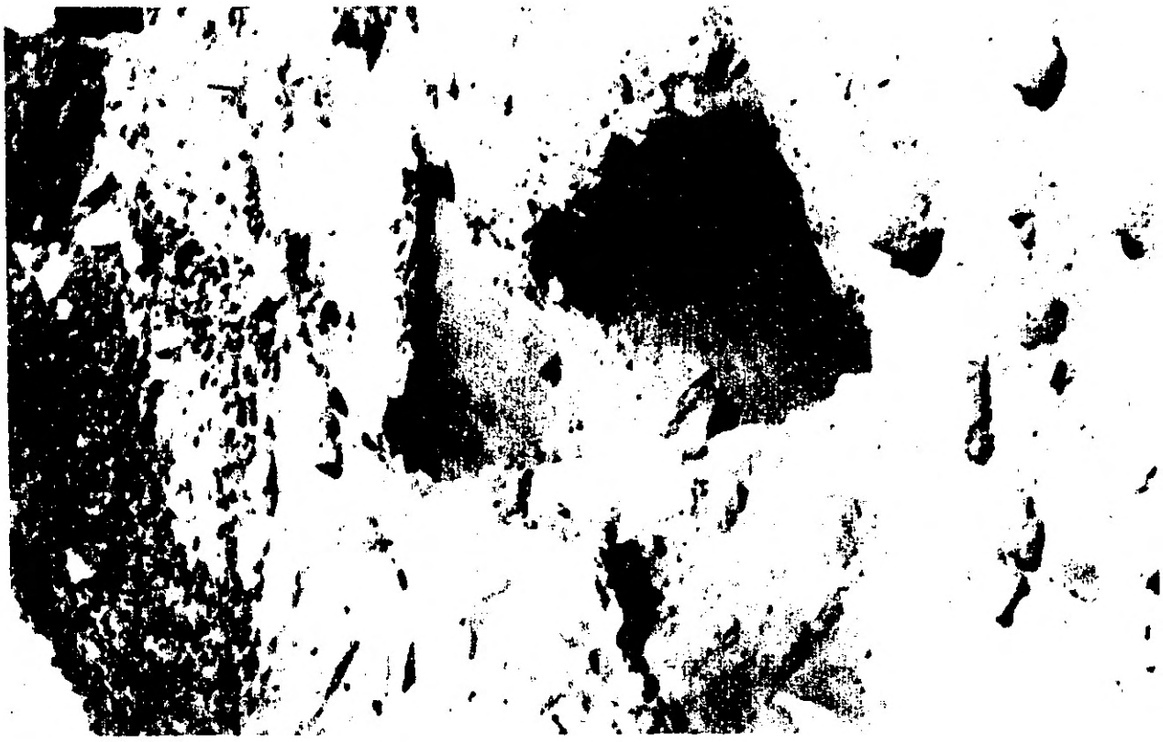

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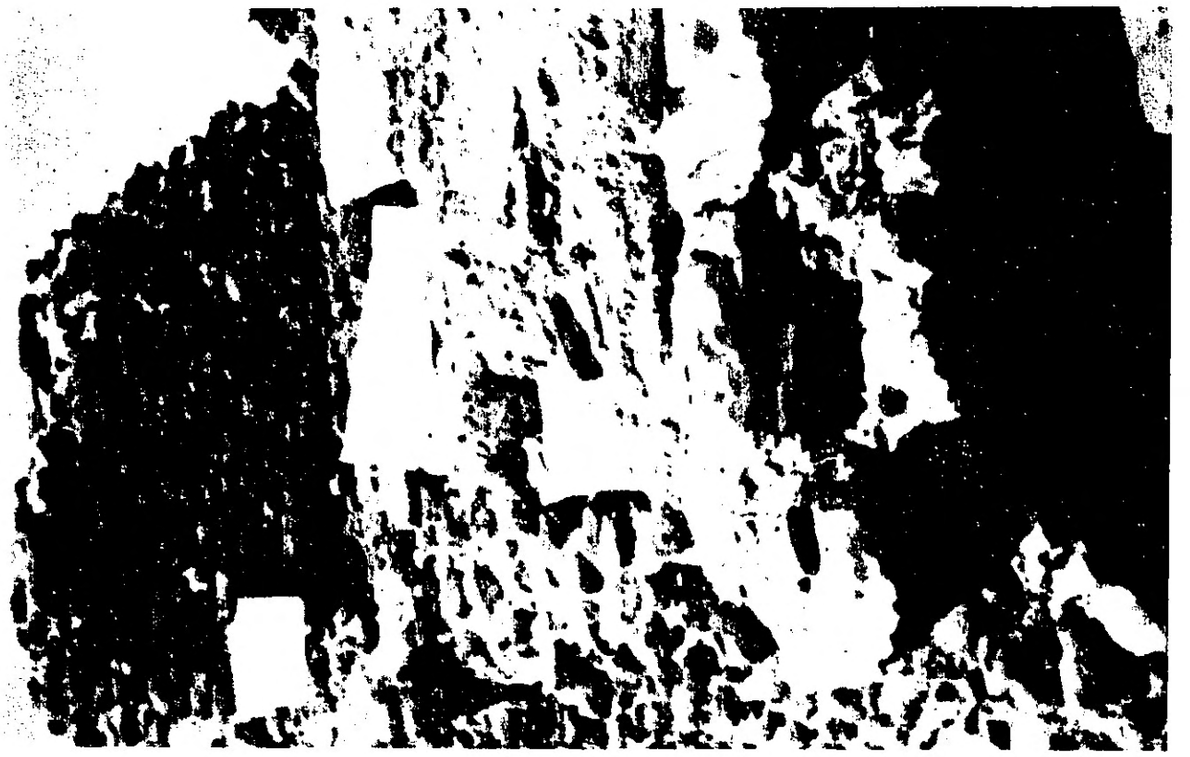

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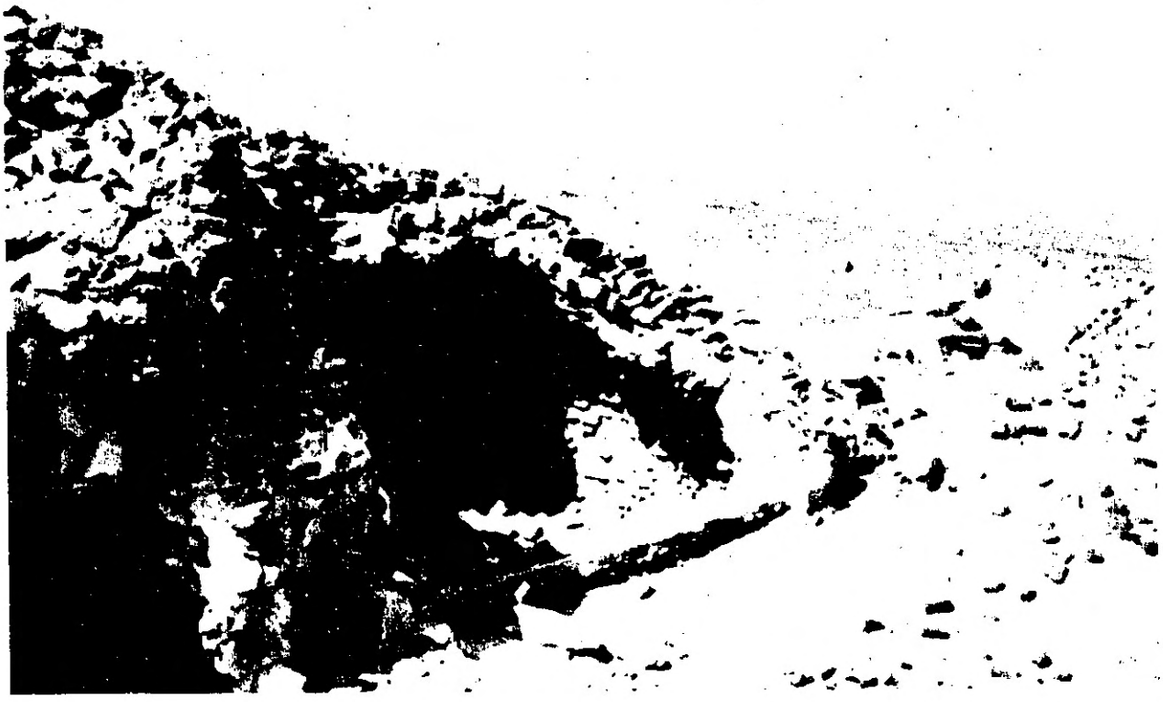

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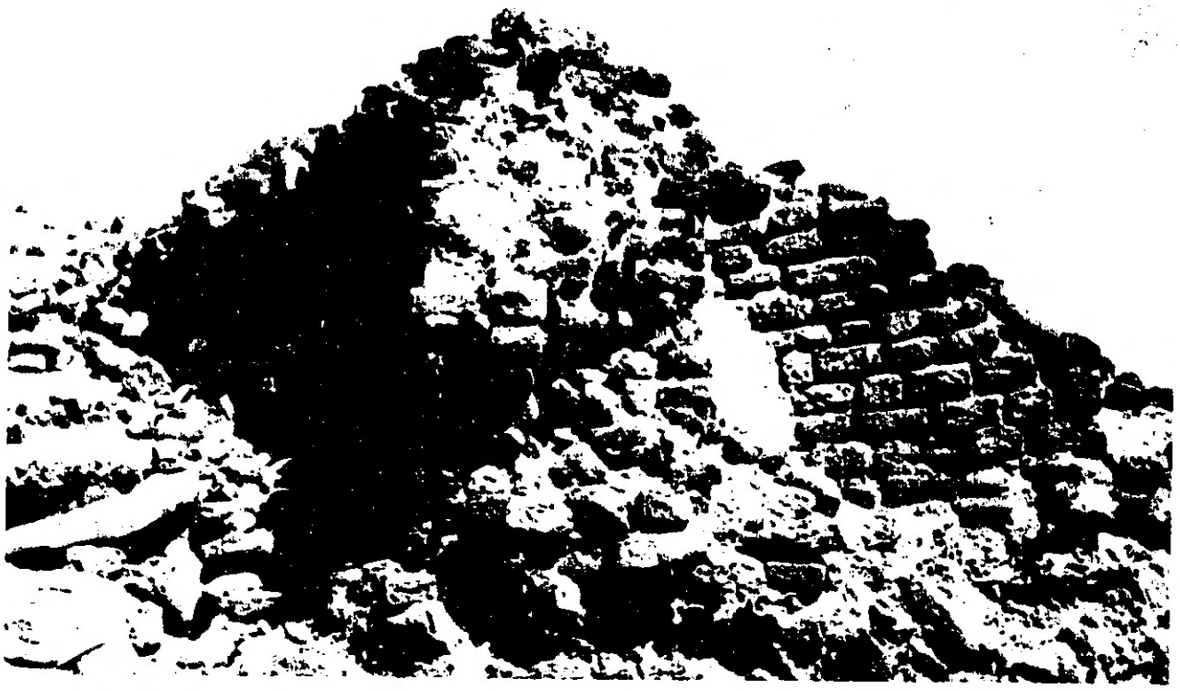

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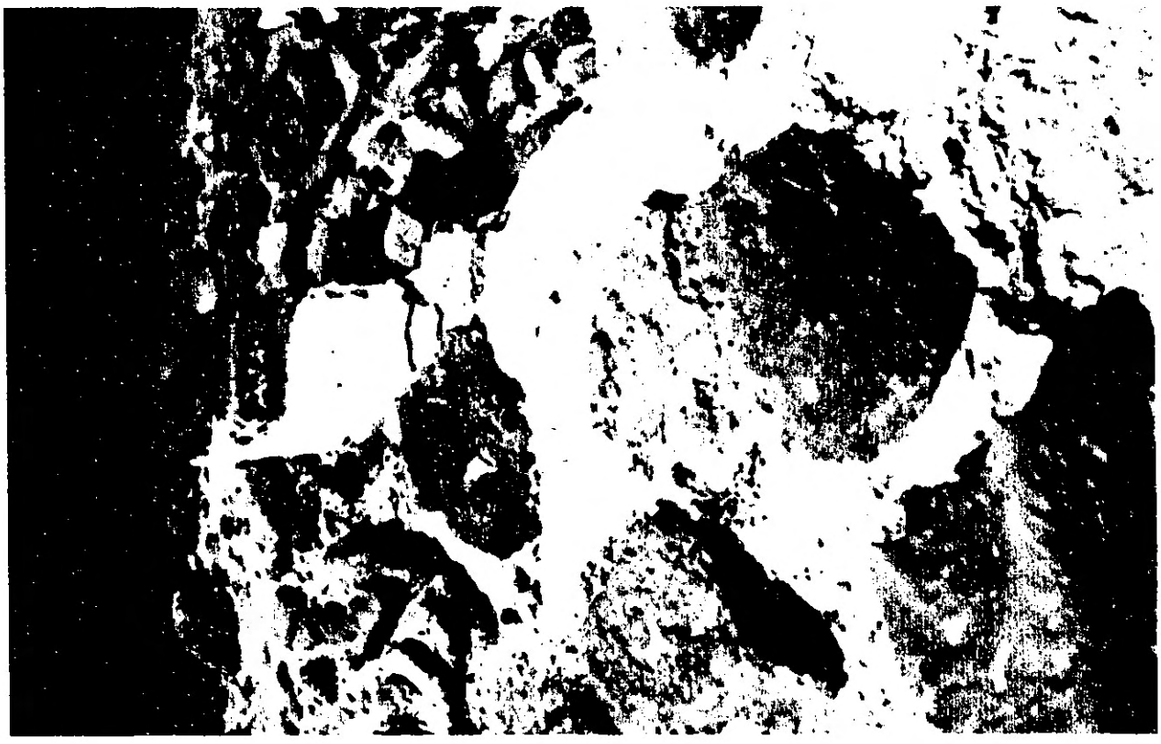

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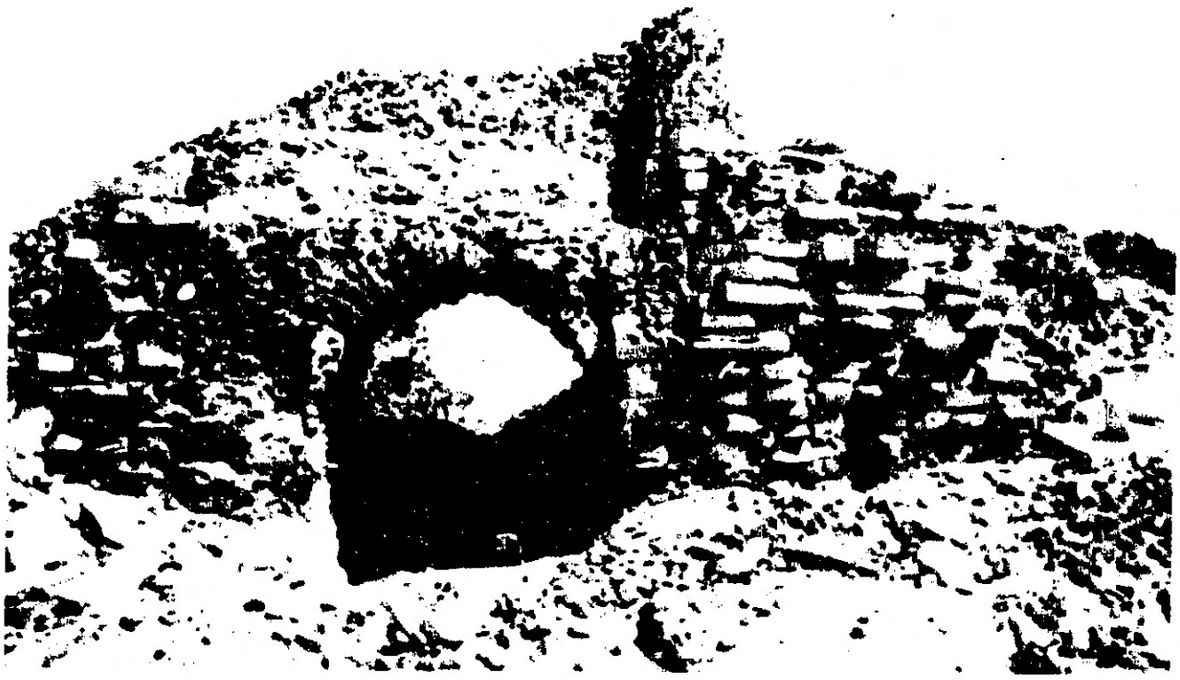

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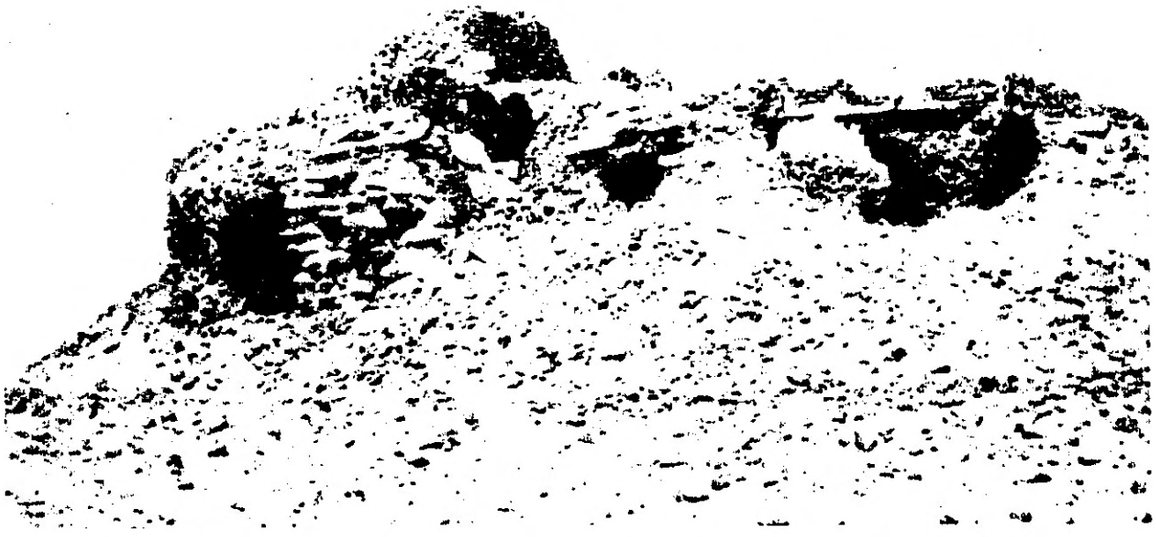

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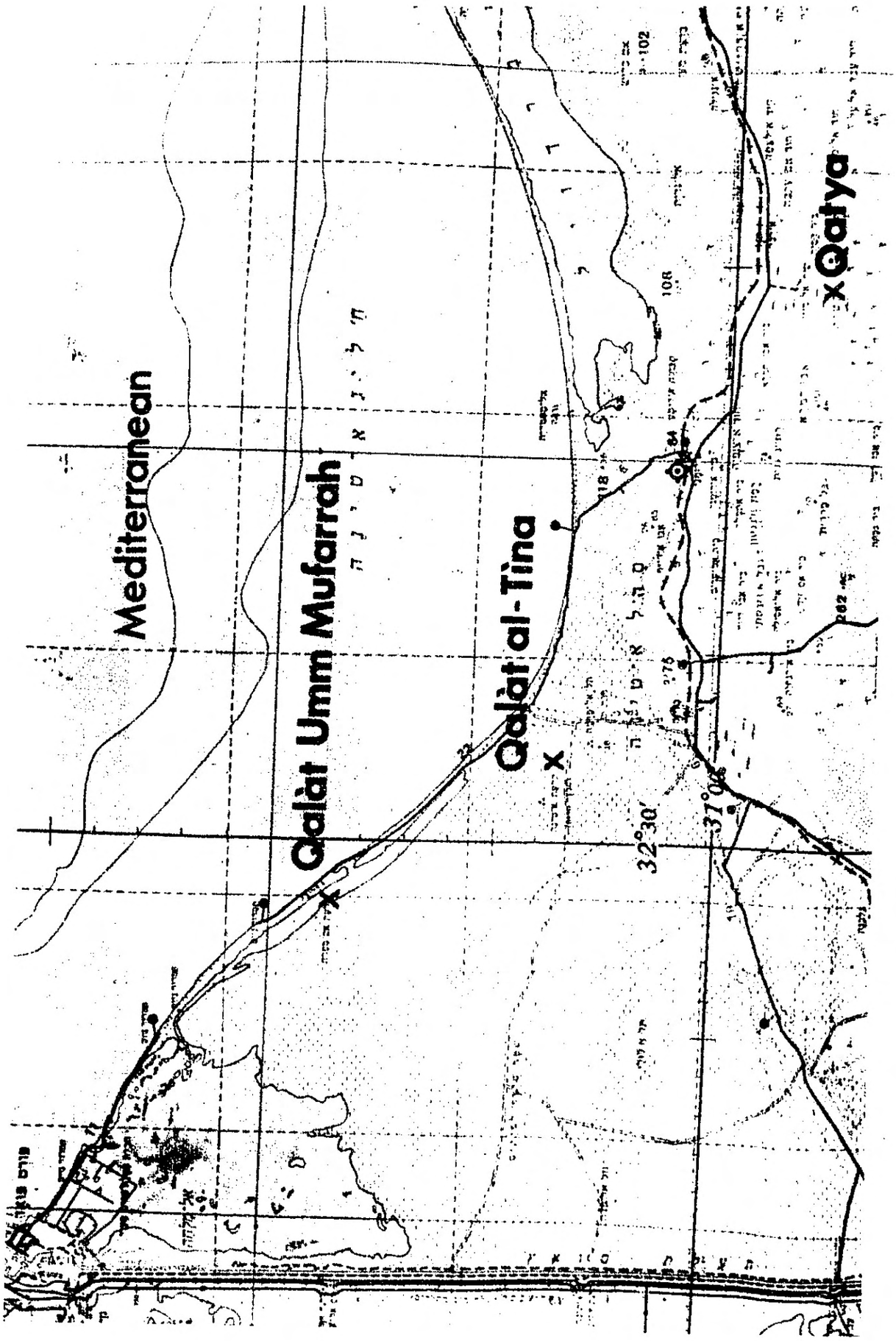
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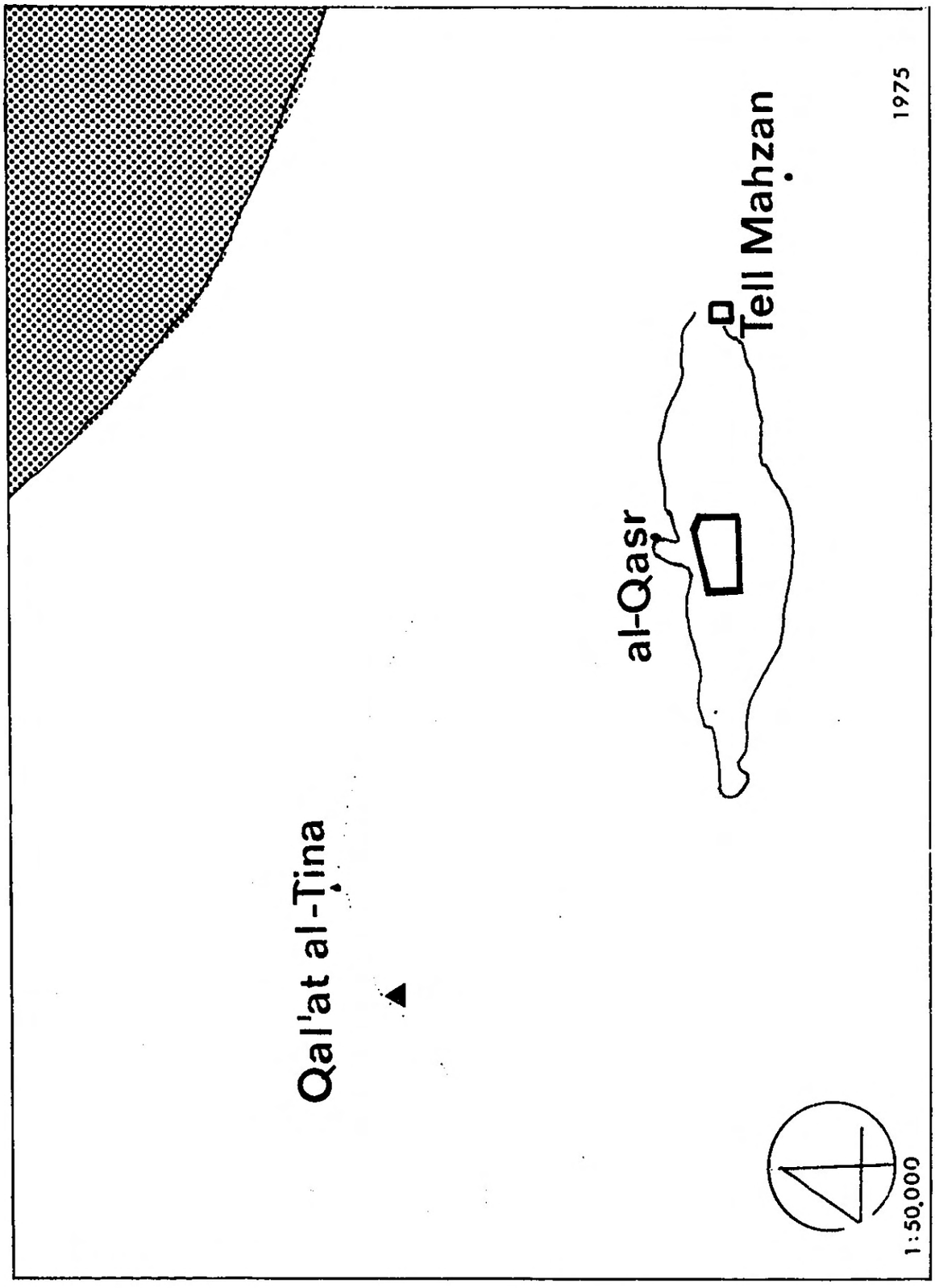
Qalàt al-Tìna
Qatya
32°30'
37°00'


Qal'at al-Ṭina
al-Qasr
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