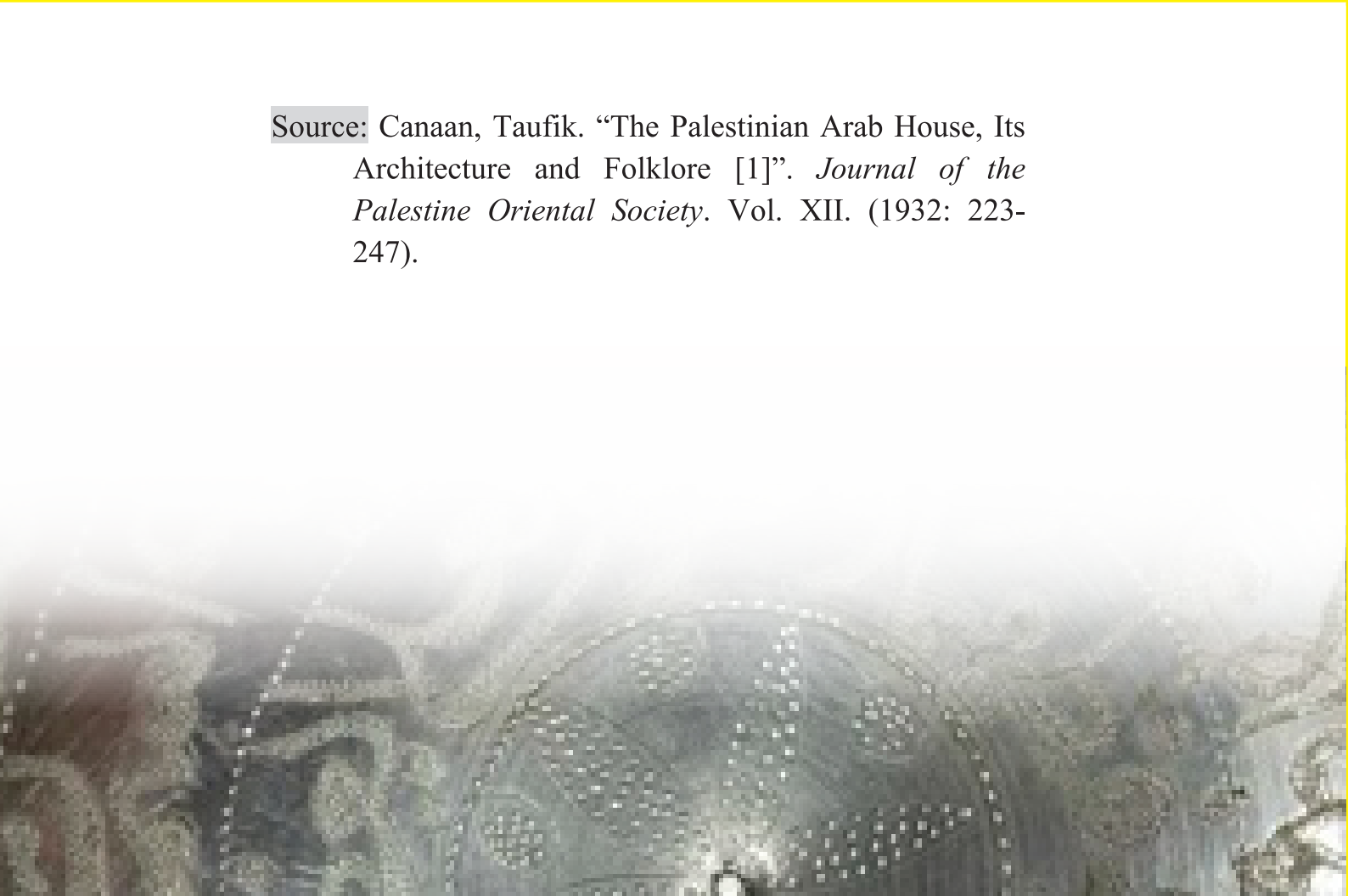


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THE PALESTINIAN ARAB HOUSE: ITS ARCHITECTURE AND FOLKLORE

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5

I. INTRODUCTORY

"House" (*bēt*) means a dwelling in general, both literally, in the sense of house, tent or palace, and figuratively, as the abiding place of an abstract thing, and metaphorically, for family. The last use will be dealt with later. Illustrations of the figurative use of *bēt* are: *bēt er-rūḥ* = the heart (house of the soul), *bēt el-kilā* = the kidney; *bēt ed-dā*¹ = diseased organ (house of disease); *bēt ʾallah*² = the house of God (church or mosque). *Bēt el-maḥḥadeh* stands for the pillow-case; *bēt er-rāḥah* (the house of rest), *bēt el-maiy* (the house of water), *bēt el-ḥalā*³ (the house of solitude), and *bēt el-ṭahārah* (the house of purity) are expressions used alike in the colloquial and the classical³ language to denote the privy. The names of certain parts of the house are also used figuratively. This applies especially to *bāb* (door). Thus *bāb imm el-ʾawlād* (*bāb el-mawladeh*) denotes the cervical canal of the uterus (Job 3¹⁰); *bāb el-badan*,⁴ the anus. *bāb ʾallah*⁵ (the door of God) has a curious use: if one is asked where he is going, and he does not wish to say, he answers *ʾala bāb allah*,⁶ every place being the "door of the Almighty"; no further enquiries are made. This term *ʾala bāb ʾallah* is also used adjectivally for a "stupid man" or a "simple *darwīš*." When rain falls heavily the Palestinian says *infatḥat abuāb es-samā*, "the doors of heaven have been opened."⁷ *Muftāḥ es-samā*, "the key of heaven," by which heaven's

¹ An old Arabic axiom says *al-maʿdah beitu_d-dā*.

² According to *muḥīt*, p. 146, it means also a cemetery.

³ See *muḥīt*, p. 146.

⁴ Also called *bāb ed-dibr*.

⁵ WARNER, *In the Levant*, 1892, p. 211, speaks of the "Gate of God" in Damascus, which sees the departure of the annual procession of pilgrims to Mecca.

⁶ This word may also be used interrogatively: "Where are you going?"

⁷ The Bible (Ps. 78²⁵) uses this expression. In Gen. 7¹¹ we have also "the window of heaven."

door is opened to allow the rain to pour through, is supposed to be in the hands of certain saints. In Bēt Djālā the peasants sing:

mār ʾInqūlā dʾjinā lēk
šuhb el-matar dāḥil lēk
ʾihnā l-yōm ʾabidak
muftāḥ es-samā fi ʾidak

We are come to thee, St. Nicholas!

O stream of rain, I implore thee!

We are to-day thy servants.

Heaven's key is in thine hand.¹

Bāb er-raḥmeh (the door of mercy)² is used in some parts of Palestine³ for the west, since it is from the west that the rain usually comes. The proverb *el-marah muftāḥ er-radjul*,⁴ "The woman is man's key" implies that she can extract from him every secret. In prayers to God we hear the petition *yā rabb iftaḥ ʾalēnā bāb raḥmatak* ("O Lord, open upon us the door of thy mercy!"),⁵ *bāb er-riz(i)q* (the door of maintenance), *bāb el-ḥēr* (the door of riches), *yā fattāḥ el-ʾabuāb*, ("O Thou that openest all doors, i.e. that givest relief in all difficulties"). There is a Moslem belief that the gates of heaven (*ʾabuāb es-samā*)⁶ open in the night of the 27th of Ramaḍān, *l̄latu el-qadr*, "The Night of Power." The Christians have a similar belief about *ʿid iṣ-ṣalīb* (the Feast of the Holy Cross) and Epiphany.⁷ At such a time all prayers are heard. The Persian ʿAlī Mirzā, founder of Baháism, is himself called *al-bāb*, the Gate (of God).⁸ His followers who live in Acre still use the term in referring to him.⁹ Again

¹ In *Mohammedan Saints and Sanctuaries* (p. 230) the complete song is recorded with translation.

² The north door of the Ḥaram also bears this name.

³ Dēr Ghassāneh.

⁴ An alternative form is *er-ridjāl qif uil-marah muftāḥ*, "The man is a lock and the wife is the key."

⁵ *Bāb el-Wād*, "the gate of the valley," is the name given to wādi ʿAlī where it leaves the mountainous region.

⁶ Prov. 8²⁴; Sir. 14²⁴. The Palestinian speaks also of *ʾabuāb dʾjhanam*, "the gates of hell."

⁷ September 13th and January 6th respectively. See CANAAN, *Plantlore in Palestinian Superstition*, JPOS, vol. VIII, p. 165.

⁸ Jesus says of himself "I am the door," John 10⁷.

⁹ LUKE and KEITH-ROACH, *The Handbook of Palestine*, 1930, pp. 70, 71.

both in classical and colloquial Arabic "bāb" can signify direction and also a part or chapter of a book.¹ In giving a direction we hear *ta'al min hal-bāb uin mā nifiš ta'alluh min ghēr bāb*, "Approach (him) from this direction (lit. door) and if it does not help go to him from another way." The foundation of the house, the most important part of the building, can also be used figuratively; *asāsuh imnīh*, 'āṭil (his foundation is good, bad); *il-mas'aleh ḥarbāneh min asāshā* (the matter is rotten from its foundation).²

Since the purpose of this article is to describe the dwelling house of the inhabitants of Palestine, all other uses and meanings of the word *bēt* and words denoting parts of a house may be disregarded. It may be assumed that, in general, the present people of Palestine are housed in a manner not greatly different from the manner usual in ancient times: a minute study of the methods of construction and use of the Palestinian Arab house and the folklore associated with it may, therefore, throw direct or indirect light on earlier conditions. The present inhabitants of Palestine, like their forefathers, are of two classes: dwellers in villages and cities and the Bedouin. As the life and habits of the one class differ from those of the other, so do their houses differ.

Houses in villages are built of durable material, since their occupants have settled down to agricultural work; on the other hand, Bedouin dwellings, tents, are more fitted for nomadic life and are portable, airy and light. Both tents and stone houses are termed "*bēt*," *wabar* or *šar* (hair) being added in the case of tents and *ḥadjar* (stone) in the case of durable house.

Beside these two main kinds (which will be described later) there are two other types of dwelling sometimes used and needing special mention: the cave³ and the hut.

Caves (*mghārah*, pl. *maghāyr*, *maghāwir*, *mughr*⁴) are at present used as human dwellings only by the very poor (Arṭās), shepherds,

¹ *Muḥīṭ*, p. 139.

² The Bible uses "foundation" when referring to heaven and earth; Job 38⁴; Ps. 89¹²; Prov. 8²⁹; 3¹⁹; Luke 11⁵⁰; John 17²⁴; Eph. 1⁴; 1 Pet. 1²⁰.

³ Job 30⁶; Is. 2¹⁹; Amos 5¹¹. In Talmudic times caves were still in use as human habitations. KRAUSS, *Talmudische Archäologie* I, p. 2.

⁴ In *muḥīṭ*, p. 1528 we read *النار الكهف أو كاليث في الحجر*.

robbers and outlaws.¹ If near a village they are often used for storage or for stabling animals. Nearly all the Bdūl tribe of Wādī Mūsā (Petra), who are known as the poorest in Trans-Jordan, live in caves. Some of the Liāneh of Eldjī also spend the winter in caves. This custom is so old that many of the monuments of this "rock-cut city" bear names of families belonging to these tribes.² Many caves³ in the mountains bordering the desert are used by the Bedouin and semi-Bedouin for long or short spells, e.g. in wādī Ḥrētūn and wādī Swēnīt. When shepherds are far away from their village they drive their flock at night into a cave. The natural entrance is narrowed by large stones, the door is blocked by a tree trunk and as a rule the shepherd sleeps near the entrance. A thorny tree is usually chosen to block up the door. The trunk is drawn to the inside of the cave while the thorny branches close the entrance. Such a tree is known as *šökeh*⁴ or *sdādeh*. The shepherds generally sleep on a primitive bed made from four poles driven into the ground and joined together with thinner branches. Such a bedstead is *siddih*. At ploughing time many peasants whose fields are distant from the village make use of caves (Sammū^c, Sinnīrieh). Robbers and outlaws hide themselves in caves⁵ in lonely, inaccessible mountains.⁶

Many saints have chosen a cave for their last abiding place: e.g. el-Ḥadr (Mount Carmel), *es-šēḥ* 'Alī Qaiṭūn (Hebron), *es-šēḥ* Ghreiyb (el-Ḥadr village, near Bēt Djālā), *es-šēḥ* Yūsif (Bēt Ḥaninā), Irdjāl abū Ṭūḥ (Bēt Likiā), Irdjāl el- Arb^cin (Biddū).⁷ The parts of a cave are called *bāb*, *saṭḥ* (ceiling), *'ardīyeh* or *'ard* (floor) and *djawānīb* (sides) of the cave. A small cave is known in Dēr Ghassāneh as *ḥuzq*, meaning literally a hole. Only if a cave is used as a dwelling, a stable or a store-room are a wooden door and a few steps constructed and the interior made more habitable. Some caves, by means of a stone front and a wooden door, have been converted

¹ Outlaws hide themselves sometimes in dried up cisterns.

² CANAAN, *Studies in the Topography and Folklore of Petra*, J.P.O.S. IX (1932), p. 143.

³ V. SCHWÖBEL, *Die geographischen Verhältnisse des Menschen in der Wüste Juda*, PJ, 1907, p. 120.

⁴ Heard from Mr. O. S. B.

⁵ Cf. Judg. 6²; 15^{8ff}; I Sam. 13⁶.

⁶ II Macc. 10⁶.

⁷ CANAAN, *Mohammedan Saints and Sanctuaries*, pp. 56 ff.

into dwelling houses. I have seen such cave-dwellings in Nebī Šamuīl,¹ Dūrah and Siloah.

The hut, the most primitive form of shelter after the cave, is mainly used in the hot summer months, and is built, usually, in the vineyards and orchards. The firm substructure, circular in form, is built of 'dry' stonework. It is sometimes so high that it encloses a small chamber used as a store-room, the family living in the hut above. This stone structure is known in some parts of Palestine as *qaṣr*. The hut proper (*ʿarīṣeh*, *manṭarah* and also *qaṣr*)² is made of branches and rushes.³ Often a few vines or pumpkin plants are planted around an *ʿarīṣeh*.⁴ They grow quickly, give a better shade and a pleasant fresh green appearance.⁵ From these "high towers" it is easy to overlook and guard the whole vineyard.⁶ A large *ʿarīṣeh* which has an elongated form is known as *mʿarraṣ*. Such summer abodes need to be constructed every year; hence in the Bible they are spoken of as the symbol of transitoriness.⁷ In the front or on the roofs of some houses huts of boughs are sometimes constructed,⁸ to serve in the hot summer months as sleeping places or retreats from the heat. These, and also the *ʿarūṣ* erected on the threshing floor, are much simpler than those built in the vineyards. An Arabic proverb teaches *fī-ṣ-ṣēf faiy eš-šadjar ualā faiy el-ḥadjar fī-ṣ-ṣitā faiy el-ḥadjar ualā faiy eš-šadjar*, "(Choose) in summer the shade of trees (and boughs), not that of stone, and in the winter the shade of stones (houses), not that of trees."⁹ In northern Palestine another type of hut is met with, the *ʿirzān*,¹⁰

¹ Near *ʿen lamīr*; *lamīr* is an abbreviation of *el-ʿamīr*.

² *Qaṣr* is unknown in this sense to *muḥīṭ* (p. 1718). In the Palestinian dialect it stands also for a palace. *Muḥīṭ* gives it the last meaning and says *القصر . . . والمزل اوكل بيت من حجر وما شيد من المنازل وعلا*. *Manṭarah* is not mentioned in *muḥīṭ* although *naṭara* is known.

³ Matth. 21³⁸.

⁴ From the verb *ʿarraṣa*.

⁵ Cf. Jon. 4⁶.

⁶ CANAAN, *Plantlore in Palestinian Superstition*, JPOS, vol. VIII, p. 139. Sometimes the family lives during the summer months in the shade of a large tree growing on higher level in the vineyard. Such a place is also known as *manṭarah*.

⁷ Job 27¹⁸.

⁸ Neh. 8¹⁶.

⁹ CANAAN, *Der Kalender des paläst. Fellachen*, ZDPV, vol. 36, p. 296.

¹⁰ Neither *عرزان* nor *عرسان* are known to *muḥīṭ*. In the neighbourhood of Šafad and Megiddo the shepherd's bedstead, which he makes in a cave, is known by this term and not by *siddeh*, since it rests also on four poles.

built in the fields. Four long wooden poles (*rakāyẓ*) are driven into the ground, and the hut is constructed at the height of two to three metres. The four sides are usually left open. Only the roof, which is made of brushwood,¹ gives protection from the sun. From such a hut the watchman overlooks easily the whole field. Bedouin rarely have *‘arāiṣ* since they cannot easily be transported and very little brushwood is found in the desert.

A link between these huts and between tents and simple clay houses is the type of hut seen in northern Palestine around lake Hūleh (Merom).² These huts used by the poor Bedouin and semi-Bedouin are made of reed-mats held in place by a wooden skeleton of thin tree-trunks. The room so formed is square or more often rectangular. Each wall is made up of one or more mats, while the ceiling is usually made up of several mats suspended from a central cross pole³ (see Pl. IX, Fig. 1 and 2). The roof protrudes beyond the walls making a *rifrāf*. This type is used only by the poorer classes. In the neighbourhood of lake Hūleh one meets with villages whose houses are all of this type.

Huts are only temporary habitations. Houses and tents, however, are of permanent use and so form the essential subject of our study.

Peasants nearly always prefer elevated sites for their villages. In the hill-country we find them on the top of a hill or on a hill side, even in the plain villages are built on small mounds or hills⁴ and on this account houses in many villages⁵ rise one above the other, terrace above terrace, with fine effect. The reasons for this preference may be summed up as follows:

1. Such sites offer more scope for the expansion of the village than do valleys.
2. Rain-torrents cause less damage to structures on high ground than to those situated in low areas.
3. Mountains and hills offer a better and wider outlook, enabling the peasant to keep a watch over his gardens and crops.

¹ *Hilleh* (called also *ṣuftīn*, *Ammi Visnaga*, L.) is also used. It is a sweet aromatic plant from which the peasants make their tooth-picks.

² Such huts are also to be found in the lower part of the *‘Arabah*.

³ Such a hut is known by the term *kūḥ*, (or *bēt ḥūṣ*).

⁴ Matth. 4¹⁴.

⁵ Bēt Djālā, Nazareth, Hebron, *‘Ain Kārim*, Sileh, Salt, etc.

4. The west wind which blows over the hill-country in the summer months is both a welcome relief and a great advantage in winnowing time.

5. A high position is a naturally fortified one.

These same considerations naturally apply to the sites of most villages in ancient times. There must also be taken into account the fact that every village in Palestine honours one or more local saints, and that about 94⁰/₁₀ of all saints of central Palestine are to be found on high places which dominate the surrounding area.¹ Other conditions influenced the choice of the special part of the mountain. Thus the presence of a spring drew the village from the summit of a mountain²; the presence of natural caves had only a minor influence³; in many cases the Arab village was built on the ruins of an older site.

A peasant's house used to consist of one single room. Richer folk had more.⁴ Every such abode had but a single door opening into the courtyard. When sons married and more room was required, a second "house," i.e. a second room, was built immediately adjacent to the other. These two rooms were not connected by a door since they represented two different dwellings. The second house, like the first, opened into the courtyard.⁵ In time several such "houses" were erected near to each other, some of them being of two stories (*tābiq*, *tōq*, *dōr* or *qalbeh*). Each floor was a set of vaults. Such large buildings, composed of several apartments, may still be seen in Jerusalem, Hebron, Nablus, Dēr Ghassāneh, Djenīn, Gaza and elsewhere. A one-roomed house is generally called *bēt*, a complex building⁶ *dār*.⁷ The houses of one clan are usually built in one quarter, *hārah*. Such quarters, especially in villages, bear the name of the clan inhabiting it. In cities the religious sect

¹ CANAAN, *JPOS*, vol. IV, p. 5. ² Siloah, Liftā and Arṭās are examples.

³ JÄGER, *Das Bauernhaus*, p. 9, believes the contrary.

⁴ Every room of such a house is called *ōdah*. Early Arabic architecture followed more or less the same plan; see K. A. C. CRESWELL, *Early Muslim Architecture*, p. 3.

⁵ Probably the house of the High Priest described in Luke 22⁵⁵ was of this type.

⁶ In Syria *hārah* is used instead of *dār*.

⁷ The words *bēt* and *dār* are often used interchangeably. See also *muḥīṭ* p. 694.

living in that quarter gives it its name. Thus in Jerusalem there are the Christian, Armenian, Moghrabite and Jewish quarters. Streets bear, as a rule, the name of the particular trade carried on there.¹ The description of SCHERER² about such quarters is not correct. He writes: "Usually these quarters can be closed by shutting one or two gates in certain streets, so that they are really cities within cities." The same description is more or less true of a tent complex.³

An examination of the material used in construction shows that most Palestine houses are of two types: those of stone and those of clay.⁴ The first occur principally in the mountainous parts of the country where stone is abundant. In the Mediterranean plain and the Jordan depression, where stone is relatively scarce and difficult to transport, clay bricks were and are still used. Clay houses are cheaper and easier to build, but they are very frail and cannot long resist the action of the weather (Ezek. 13¹⁰): they have their "foundation in dust" (Job 4¹⁹), "are ready to become in heaps" (Job 15²⁸) and "by slothfulness the roof sinketh and though idleness of the hands the house leaketh" (Eccles. 10¹⁸; cf. Is. 9¹⁰). Hence they need to be repaired every year. Another defect is their liability to be "dug through" or broken into by thieves,⁵ a danger still present.⁶

Houses built of stone are of two kinds: those with thick walls and a vaulted stone roof, and those with thinner walls and a wooden ceiling. The latter type is the link between the former kind of stone house and the clay house. The clay houses have always wooden roofs. Palestine was never rich in forests; therefore the inhabitants of the mountainous region were driven to use stone whenever possible. To whatever type a house may belong there

¹ In Jerusalem one meets with *sūq eṣ-ṣuiyagh*, *sūq el-ʿaṭṭārīn*, *sūq el-qaṭṭānīn*, *sūq el-ḥudrah*, etc. See also A. MANṢŪR, تاريخ الناصرة, pp. 12ff.

² *The Eastern Colour of the Bible*, p. 37.

³ BAUER, *Volksleben im Lande der Bibel*, p. 39.

⁴ Amos 5¹¹; 1 Kings 7⁹; Is. 9¹⁰. For the Talmudic period see KRAUSS, l. c., I, p. 17.

⁵ Job 24¹⁶; Matth. 6¹⁹; 24⁴⁸. These conditions explain why so little is known about the site of several Israelitish cities mentioned in the Bible; not the slightest trace has remained of their houses (Job 4¹⁹; 13¹²; Ez. 12^{6f.}; 13^{18ff.}).

⁶ In 1931 several clay houses of the Bisān district were literally dug through and robbed.

is much variety in size, construction and finish according to the occupants' social status. The difference between the poorest and the middle-class houses is more marked than that between middle-class and the highest class houses.

In what follows only genuinely Palestinian houses will be described. The old city houses represent true Palestinian architecture and call for treatment here. It is wrong to suppose that old town dwellings embody modern European features and technique. The Europeanization of Palestine is certainly proceeding so quickly that in most villages western architectural methods are being introduced and the old oriental ways gradually abandoned: a few years more and the Palestinian methods will probably be forgotten, and the specific terms for material, work and tools will be lost. The traveller must already visit more remote villages to understand the following description. Formerly, however, all Palestinian houses were of the type now to be described.

Due credit must be given to SCHICK, BLANCKENHORN and JÄGER for pioneer work in this subject. SCHICK,¹ in two articles, recorded some Arabic technical terms dealing with stone, work and tools; most of the Arabic words were spelt and transcribed wrongly.² BLANCKENHORN³ has given an excellent description of the different kinds of stone in the immediate surroundings of Jerusalem. JÄGER⁴ has compiled many facts about house construction and the part the house plays in the life of the Palestinian. He gives only a few Arabic terms, and his work is far from exhaustive.⁵

¹ *The Stones of Jerusalem, Q.St.P.E.F.*, 1893, pp. 194ff.

² The correct Arabic spelling and transcription is given in the footnotes.

³ *Geologie der näheren Umgebung von Jerusalem, ZDPV*, vol. 28, pp. 75ff.

⁴ *Das Bauernhaus in Palästina*, Göttingen, Vadenhoek and Ruprecht, 1912.

⁵ I am greatly indebted to the following for the help they have given in determining the correct architectural terms in English, making sketches and reading the proofs: Dr. DANBY, Dr. MAYER, Messrs ADAMSON, GLUNKLER and SHIBER. The last three are well-known architects in Jerusalem. Certain of the photographs and drawings have been put at my disposal by Mr. GLUNKLER, Mr. SHIBER, Miss SCHOENECKE and Dr. EISENBERG.

II. CONSTRUCTION

A. THE STONE HOUSE¹I. *Quarrying Stones*

The first step is cutting the stone. The kinds of stone used in the hilly districts of Palestine are²

Nāri. This is a light white stone found in the district east of Jerusalem. While most other kinds of stones crack when heated, or change easily in lime, *nāri* is more or less fire-proof: hence its Arabic name "fire-stone."³ It is porous and absorbs moisture readily. The softest kind is known as *ḥaṭṭur* (ʿAin Kārim, Koloniā).

*Mizzī yahūdī*⁴ (BLANCKENHORN *Ammonitis [Acanthoceras] Palestinensis n. sp.*). This comes from the deeper strata and is so compact and hard that it is only slightly affected by weather. The following varieties occur: blue (*azraq*), white (*abiād*), red (*aḥmar*) and yellow (*aṣfar*). The last is known in Jerusalem as *ḥadjar Yāsīnī*, since it comes from Dēr Yasīn. The blue quality is the most durable and has the lowest coefficient for the absorption of moisture. The red stone tarnishes with time since it contains ferric oxide.⁵ The best quality, the so-called Palestinian marble, comes from eṣ-Ṣlaiyb, to the north of Bethlehem and Bēt Djālā. It shows beautiful light and dark reddish veins (ʿ*rūq*, pl. of ʿ*irq*). The greenish kind, *mizzī aḥḍar*, is found in the Taʿamrī

¹ The material used in building village houses differs but little from that used for town houses. A complete and systematic account of the work will be given in due course. The writer must acknowledge that beside the great number of technical terms which he has been able to collect there are many others which he has failed to record.

² See BLANCKENHORN, *ZDPV*, vol. 28, pp. 75ff; C. SCHICK, *The Stones of Jerusalem, Q.St.P.E.F.* 1887, p. 50.

³ *Muḥīṭ*, 2143, does not give this meaning, but writes النورّة حجر الكلس ثم غلب على اخلاط تصاف الى الكلس من زرنخ وغيره ويستعمل لازالة الشعر.

⁴ In the district of Djenīn it is known as *ḥadjar muāsi*. In classical Arabic *ḥadjar yahūdī* stands for Lapis Judaicus (Hava, p. 831).

⁵ I owe this information to the kindness of Mr. Samāḥah, architect in Jerusalem.

region east of Bethlehem, and is very expensive. When the stone is rich with veins it is said to be *imšadjjar*.¹ The hardest quality of this stone is known in Ḥammān as *ḥadjar zifer*. *Malakī* ("the royal stone")² is a favourite stone for dressing and building. It is of two sorts: the *malakī abiaḍ* and the *malakī sulṭānī*. "Solomon's Quarries" and the Ramallah district supply Jerusalem with this stone. When newly quarried it is soft; through exposure to the air it noticeably hardens.³ It becomes yellowish in time. This hardness does not withstand the effect of weather and it is liable to flake and crumble.

Kaḥkūleh is a whitish stone with occasional red veins. It is easily cut with the saw.⁴ The lower strata of *Kaḥkūleh* rock are harder than the upper strata.⁵ A specially brittle kind is known as *kaḥkūleh qazzāzī*. Jerusalem gets this stone from Ḥanātā, the Mount of Olives and *wādī en-Nār*. The *kaḥkūleh* from the Mount of Olives is softer and whiter than that from the other sources. The *wādī en-Nār* kind weathers very badly.

Mizzī ḥilū is whitish and rich in yellow veins. Jerusalem is mainly supplied with this stone from Bēt Ḥanīnā and Šuḥfāt. A peculiar characteristic of *mizzī ḥilū* is the presence of laminations. It comes next to *mizzī yahūdī* in durability and non-absorption of moisture.

The black basalt stone, *ḥadjar ḥaswad*, is found in Ḥaurān, some parts of the Nazareth district and in Bīsān. It is a hard and compact stone.

Huwar is a very soft clayish stone and can hardly be classed with rock proper. Powdered and mixed with lime "it makes the mortar for fireplaces and baking-ovens."⁶ The longer it is exposed to the atmosphere the harder it becomes.

Classified according to hardness the varieties of building stone

¹ See also L. MAYER, *A Medieval Arabic Description of the Ḥaram of Jerusalem*. The Quarterly of the Department of Antiquities in Palestine, vol. I, p. 44.

² It is called by BLANCKENHORN "Rudistenmarmor."

³ Most of the rock-cut tombs are excavated in this rock. The exposed part of the rock which is harder than the rest is called "*ḥadjar šamsī*" (Ḥen Kārtm).

⁴ The words *mizzī*, *malakī* and *kaḥkūleh* are not known to *muḥīṭ* in this sense.

⁵ The harder kind is, according to BLANCKENHORN, *Ammonites oliveti n. sp.*

⁶ SCHICK, l. c.

come in the following order: *nāri*, *ka'kūleh*, *malakī*, *mizzī hīlū* and *mizzī yahūdī*, the first being the softest and the last the hardest. Sandstone (*ḥadjar ramī*) is found and used only in the towns and villages of the Mediterranean plain. Flint (*ṣuwān*) is the hardest stone. Since it is very difficult to cut and to dress *ṣuwān* is never used in building. Formerly flint used to be crushed and placed in a layer under the stony pavement of ovens, being a good insulating material. Its hardness is referred to figuratively in proverbs. *'Aqluh 'aqsa min eṣ-ṣuwān*,¹ "His intelligence is harder than flint"; *tirbāyt eṣ-ṣubiān miṭl qarṣ eṣ-ṣuwān*, "rearing and education of boys is like crushing flint (with the teeth)." A saying about rejected advice is *kalāmak naqr fī ṣafā*,² "Your speech (advice) is (like) drilling a hard, large rock."

The peasant must prepare his material before building. This may take him several months since it is done only in his spare time and when he is unable to earn money in other work. Most of the preparatory work, like digging the cistern, cutting and dressing the stones, carrying the *djabṣ*³ and the *ṣarār* and digging out the foundation, is done by the owner and his sons. Since the city dwellers and some well-to-do peasants cannot do all the work themselves they buy the stones and the *djabṣ* and employ labourers to dig the cistern and build the house. Therefore quarrying and dressing stones was and is still a paying trade.

Quarrying stones (*et-tahdjir*, *qat' el-ḥdjār*) is the first step. The earth is cleared away from the surface of the rock (*bikṣif 'an eṣ-ṣaḥr*). The tools used are the *fās* (pickaxe), *tūriyeh* or *madjrafeh*⁴ (larry, PL. X, l), and *quffeh*⁵ (basket). The *fās* (PL. X, h) has a pointed and a broad edge known as *tumm* (or *būz*) *rafīc* and *tumm* (or *būz*) *'arīq*⁶ respectively. Even this simple work of digging and carrying earth is considered more honourable than dependence on the help

¹ I have also heard *tab'uh* (character) instead of *'aqluh*.

² See also *muḥīṭ*, p. 1194.

³ Not known to *muḥīṭ* in this sense.

⁴ There is a proverb which says *mā ba'd eṣ-ṣabr illa l-madjrafeh uil-qabr*, "There is nothing (to be expected) after patience, except the larry (with which the tomb is dug) and the grave."

⁵ Of a person who tries to attain his goal in one single action it is said: *binuṭṭ min el-quffeh ladīnēhd*, "He jumps from the (bottom of the) basket to its ears (handles)."

⁶ Lit. a thin and a broad mouth.

and mercy of others: *ištghil bil-fās walā ‘āzet en-nās*, "Work with the pickaxe and do not (become so destitute as to) need (the help of other) people."¹ The quarrymen, *ḥadjdjārah*, blast a hole at the edge of the area to be excavated; this hole must penetrate the greater part of each layer of rock in turn, *biftaḥū ridjil* (or *idjir*) *laṣ-ṣaḥr*. It is slowly enlarged. The space between two layers of rock (the natural bed of the rock) is known as *ḥall eṣ-ṣaḥr*. A hole for blasting (*nuqr*, more seldom *muqr*) is drilled by means of the *nuḥl*² *naqr* (Pl. X, b). This hole should never reach the *ḥall*. A man squats or stands on the rock and manipulates the *nuḥl naqr*, with continuous, vigorous up-and-down blows, at the same time revolving continually the steel drilling-rod on its long axis. The beginnings of the *nuqr*, preparatory to the drilling, are made by the *rās* (Pl. X, f), a heavy hammer pointed at one or both ends. The drilling tool (*nuḥl naqr*) is a steel bar five to six feet in length with a drill point at one end shaped and tempered like a chisel. From time to time a little water is poured into the drill-hole, and the hole is slowly sunk to a depth of twenty to twenty-six centimetres above the *ḥall*. Its depth thus depends on the thickness of the rock layer. The *nuqr* is usually drilled in a slanting direction with its lower end pointing to the free edge of the rock.³ Through the continuous driving of the *nuḥl* a fine powder results which, mixed with the water poured into the hole, makes *ḥinet en-nuqr*. This mud is removed by a long iron rod with a small, round and spoon-like projection at its lower end, the so-called *mal‘aqah* (spoon, Pl. X, g).⁴ As soon as the *nuqr* is deep enough it is allowed to dry. The bottom few centimetres are filled with powder, *bārūd*, which is gently pressed down with the *ma‘bā* (Pl. X, i). This *bārūd* layer is called *ti‘bāy* (filling). The *m‘abā* is a steel rod, .5-.75 cm. less in diameter than the *nuḥl en-naqr*, with flat and blunt ends. An *ibrit naqr* (Pl. X, e, drilling needle) is inserted down one side of the hole. Its pointed end reaches the lower powder layer.⁵

¹ Heard in Nablus.

² Not known in *muḥīṭ* in this sense.

³ The exact direction of the drilled hole depends on the way in which the rock is to be blasted. *Lughm* is a synonym to *nuqr*.

⁴ In Trans-Jordan (‘Ammān) the Turkish expression *ḥāṣūqah* is used for *mal‘aqah*.

⁵ At its upper and free end it has a transverse handle, looking like a T.

Small dry stones are slowly dropped into the hole and crushed by a gentle stamping movement of the *maṣbā*. No flint stones are used for fear of striking fire and causing an explosion. Some mix small pieces of pottery with the stones since they are more easily crushed; but stones are usually preferred. As soon as the *nuqr* is filled with the crushed stones, the *ibrih* is extracted by gentle circular movements. The narrow hole so formed is filled with fine sifted powder, *barūd duqq*. This filling, *idḥīr*¹, makes an uninterrupted line of powder with the *tiḥbāy*. Coarse powder grains, *barūd dirs*,² are never used for the *idḥīr*, since they may block up the drill-hole and so break the continuity of the fuse. When several drill-holes have been treated in this way and are ready for explosion, all workers are warned to leave the *maḥdjarah* (quarry). A few workers then station themselves at a safe distance from the point of explosion in different directions, shouting *ḥādūr bārūd*, "Take care! powder (is being exploded)!" so warning other workers or passers-by. The *idḥīr* is lighted and the rock is blasted. When rocks are exploded inside a cistern, cave or room, large pieces of stone or heavy iron bars or bags of earth are put on the rock, to diminish the vibration and to prevent exploded fragments of rock from damaging the ceiling and walls. In this case the *idḥīr* or fuse line is laid in a channel along the floor to a place near the exit of the room or cave, thus giving the person who lights the powder sufficient time to get away. Such a fuse line is called *fīleh*. If the powder does not explode the workers say *el-ṭalaq qaṭaṭ*, which condition happens when the continuity of the powder is interrupted or if the powder is of an inferior quality or damp. When the *nuqr* is drilled too far from the free edge of the rock, large pieces of rock are separated and one speaks of a *ṭalaq ʿābiṭ*. Such large pieces of rock (*qalʿah*, pl. *qlāʿ*, *qilas*) are difficult to remove and require much labour to break up into workable pieces. Large stones, such as a camel can carry only two at a time, are called *ṣaqqāt* (*djamaal*).³

¹ This word is known to *muḥīṭ* (710) for the powder used in old fashioned cannons : الذخير عند المولدين البارود الذي يوضع خارج المدفع بجانب الثقب الناقد الى داخله :

² Neither *dirs* nor *ḍirs* is known to *muḥīṭ* in the sense of "grains".

³ شقات (pl. of شقة) and not شكاة as given by SCHICK.

Talaq zakkah or *talaq masdjūh* is an explosion of the rock by a very slanting *nuqr*. It is the proper method of drilling in free rocks of *mizzī hilū* and *kaskūleh*. When large-sized stones have to be quarried another method is used. Two deep and perpendicular grooves meeting at a right angle are cut in the rock. At the lower edge of the rock only a superficial groove is hollowed out. Wooden wedges are driven into the deep grooves and water is poured in. This method which was formerly very common is now rarely used.¹

The large pieces of rock detached by the explosion need to be shifted away by a *nuhl imqāwabeh*² (also called *nuhl qōb*,³ crow-bar, Pl. X, k). The strong and thick iron rod is worked like a lever with the fulcrum near the stone. The part of the *nuhl* from the fulcrum to the rock is much shorter than the other arm, thus requiring less power to move the *qal'ah*. A hard stone or a piece of iron, generally the *mahaddeh*, is used as a fulcrum, the so-called *el-qāḏī*.⁴ This word means "the judge" of a Mohammedan religious court. The Christians, who formerly constituted the majority of stone-workers in the Jerusalem district, gave this name to the fulcrum as a gibe at the Moslems. One would hear them shouting: "Get the *qāḏī*," "Press upon the *qāḏī*," "The *qāḏī* is broken in pieces," "May God curse the *qāḏī*," etc. The Moslem peasants revenged themselves in another way which will be described later. Once removed from its place the *falaqah*⁵ or *qal'ah* must be broken into smaller pieces. With a *šōkeh*⁶ (pointed chisel) and a *maṭraqah* or a *šākūseh* (Pl. X, c) a wedge-shaped furrow is cut in the centre of the broad surface of the *falaqah*, and this furrow is further deepened with a *qaṭṭā'ah*, pointed pick hammer, (Fig. 1, b;

¹ My attention was drawn to this method, which is being followed in Kalandiā, by Mr. WINTER.

² مقاربة and not مقاربة (Q.St.P.E.F. 1893, p. 198).

³ Although *qōb* is not known to *muḥīṭ* in this sense, the verb *qāwaba* means to break asunder (see Hava). When the blasted pieces are not very large they are removed by an *ataleh*, a short, thick steel rod. This tool has been introduced only recently from the Lebanon.

⁴ Not known to *muḥīṭ* (p. 1727) in this sense.

⁵ A *falaqah* is a small *qal'ah*.

⁶ Not known to *muḥīṭ*, 1140, in this sense. It is correctly derived from the root *sawaka*.

Pl. X, f).¹ This furrow is called *tabyīteh*. A wedge-shaped piece of iron, *yasfīl*,² is introduced into the *tavyīteh* and held in place by 'leaves' of iron, *waraqah*, or more commonly by old horse-shoes (*hadueh*, pl. *haduūi*). With a large heavy hammer, *m(a)haddeh* (also known as *naḍweh*, (Pl. X, d and figure 1, a in text), the worker strikes the iron wedge until the rock splits. From time to time the *ṣaghghīl* (the worker) hammers on both sides of the furrow, as well as in front and behind the wedge, in order to prevent the rock from peeling or cracking in an undesired direction. This act is called *isammī' eṣ-ṣaḥr*. The larger pieces are cut into shape by the *ṣāqūf* (quarryman's dressing-hammer, Pl. X, a)³ or *ed-dabbūrah* (Ammān). The last is a heavy hammer with one end pointed and the other flat. This process is known as *et-taqṣīb*. Such stones are later passed to the stone dresser. A stone that is not cut in the right shape may be *maftūl* (twisted) or *mahlūl* (with acute angles). A proverb compares a person enduring many difficulties, to a stone worked with two such hammers, *miḥl l-ḥadjar bēn ṣāqūfēn*, "Like a stone between two hammers." Undressed stones are sold by the metre. The price depends on the kind, quality, breadth and thickness of the stone. The pieces of stone are transported by camel from the quarry to the building site. For short journeys donkeys and mules may be used. Now more modern means of transport, motor-lorries and wagons, are used.

2. Dressing the Stones (ed-dqāqah)

An undressed stone is *ḥadjar ḥām*. In describing a boorish person the Palestinian uses this term: *lissātuh ḥām*, "He is still inexperienced, clumsy." The pieces which fall away while cutting the rough stone into shape, are called *ṣuḥaf* (pl. of *ṣaḥfeh*). The stone-dresser (*daqqīq*, pl. *daqqīqah*) uses the following tools ('*iddeh*⁴): *ṣōkeh* (pointed chisel,

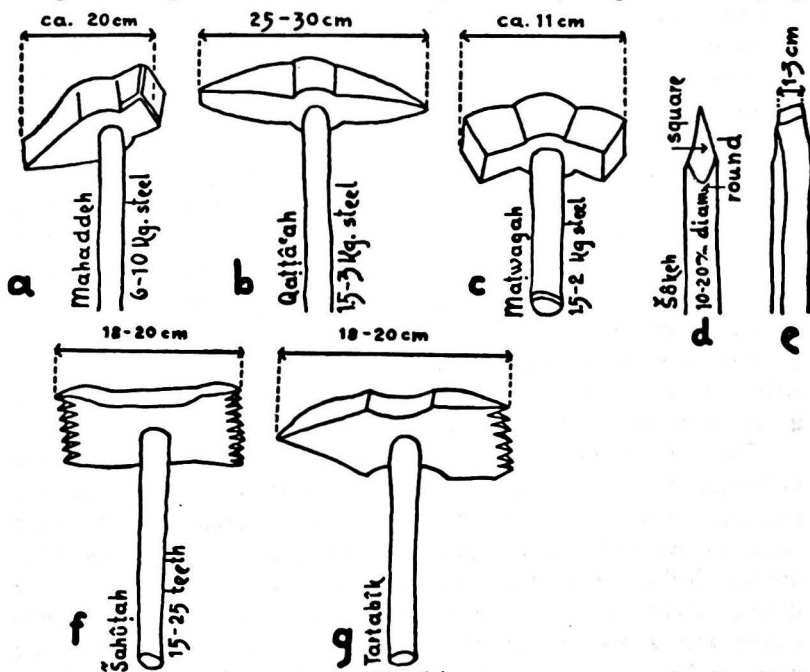
¹ *El-bīk* is like a *qaṭṭā'ah*, hammer, both ends of which are pointed. I heard this expression in Ammān.

² *ḍasfīn* (أسفين) or *ḍasfīl* (أسفيل).

³ A small *ṣāqūf* is called in Ammān *māṣah*. Its hammering surface is not square like the former, but octahedral.

⁴ '*iddeh* denotes tools in general. One hears the expressions '*iddeh el-ḥadjdjārah*, '*iddeh ed-daqqīqah* (or *ed-dqāqah*), '*iddeh el-bannā*, etc.

Pl. XI, Fig 1, d), *yazmīl*¹ (flat, slightly sharp chisel, Pl. XI, and Fig 1, e), *maṭraqah* (dresser's hammer Pl. XI, a and Fig 1, c), *ṣāhūtah*² (toothed hammer, Fig 1, f)³, *tartabīk* (a hammer with one end pointed and the other toothed see: Fig. 1, g), *maṭabbēh* (bush or granulating hammer Pl. XI, b, c), *zāwīeh* (set square Pl. XI, d),

Fig. 1.⁴

*drā*⁵ (a ruler one yard in length), *mitr* (metre) and a *rās* (pointed hammer). A *munqār*, which is a pointed chisel larger than the *ṣōkeh*, is used to drill holes in stones. A *tunbur*⁶ is a large *yazmīl*

¹ Also *azmīl*.

² شاحوطة not شاحوطة (QSt, 1893, 199).

³ *maḡasṣeh* is a synonym used in 'Ammān.

⁴ Two terms are here misspelt: *maṭraqah* should be *maṭraqah* and *sāhūtah*, *sāhūtah*.

⁵ Or a *qiddeh* (not *qiddeh*, Q.St.P.E.F. I. c.) which is a long, straight, wooden ruler. Formerly iron rulers were also known.

⁶ *Tunbur* means also a two-wheeled carriage drawn by a single beast and used for the transport of stones, earth, water, vegetables, and the like.

used to cut in a straight line the edges of a rough stone. These last two tools are not used very widely.

A *sāhūjah* and a *tartabik* are not used in dressing the *yahūdī* stone while the *maṭabbeh* is only employed in dressing the harder stones, for the powder of the softer kinds (*nāri*, *ka'kūleh*) easily fills the spaces between the teeth and clogs them. The *snān* (teeth) of the *maṭabbeh* are of different grades. The *maṭabbeh* generally used has *sinn* 'asarah (ten teeth). *Maṭabbeh hišneh*, with coarse teeth, has 25 (5×5) points per hammer face of 45×45 mm. area, *m. wasaṭ* (medium), 64—81 (8×8 to 9×9) points per 35×35 mm., and *m. nā'meh* (fine), 169—225 (13×13 to 15×15) per 35×35 mm. area. Pieces which fall during the dressing of the stones are known as *nḥāteh* and a dressed stone is *ḥadjar madqūq*. Some tools have to be sharpened from time to time. This *ṣrāfeh* is done by the smith (*ḥaddād*) or by gypsies (*nauar*). The latter go from village to village doing such petty smith's work. Such tools are: *Šaqūf*, *qāṭṭā'sah*, *nuhl naqr*, *rās*, *yazmīl*, *ṣōkeh*, *mahaddel*, *šāhūjah* and *maṭabbeh*. Charcoal is used for heating the tools. The fire is kept going by means of a skin bellows (Pl. XII, Fig. 2).

The different kinds of dressing are known as *talīš*¹ (coarse dressing), *ṭubzī* (rusticated dressing), *imsamsam* (pick or pointed dressing), *maṭabbeh hišn* or *dirs* (coarse bush or granulating hammer dressing), *maṭabbeh*² *nā'meh* (fine bush hammer dressing), *sinn sāhūjah* (combed or dragged dressing). Of *ṭubzī* dressing two kinds are distinguished: *ṭubz šaff* (simple rustication) and *ṭubzī ibzamleh* (rustication with a drafted margin). *Talīš*, in which the stone faces are more or less evenly dressed with a *ṣōkeh* (pointed chisel), is of two kinds: the very coarse, known as *talīš infadjar* (Jerusalem), or *taqṣīb* ('Ammān), and the better dressing, *talīš nẓīf* (Jerusalem), *imšafšaf*, *ḥādjar midmāk* and *ḥadjar sūrī* ('Ammān). (*i*)*msamsam* shows the same technique as *talīš*, but is worked in a finer and more even way. No portion of the (*i*)*msamsam* stone is left undressed, while with *talīš* a certain proportion may be chipped-off stone.

¹ تلطيش and not طلتيش (Q. St. P. E. F., 1893, 195).

² مطبة not اطوبة. مطبة is pronounced with a short 'i' at the beginning. *Ḥadjar raml* (sand-stone) and *masann zēl* (oil-stone) are used for sharpening the tools.

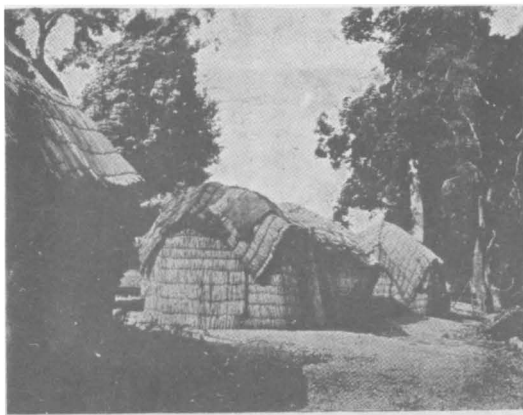


Fig. 1. Reed-mat huts (Hüleh district).

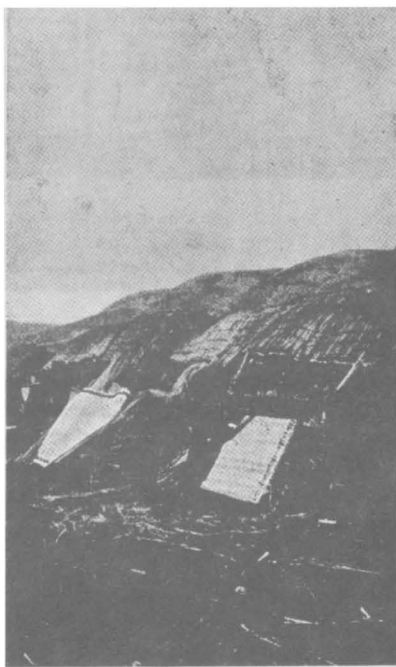
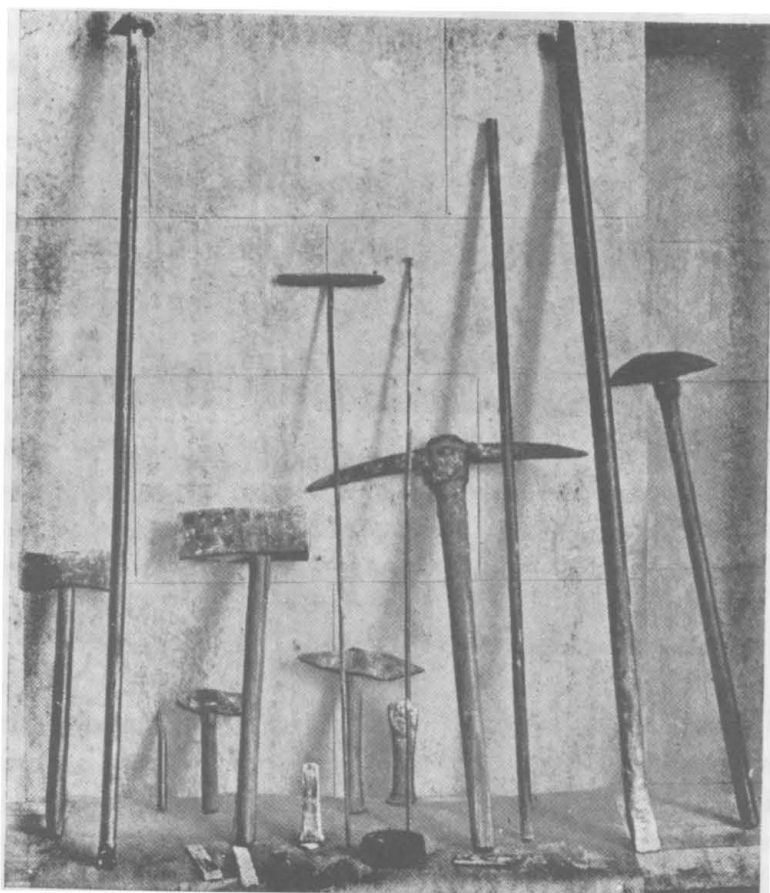
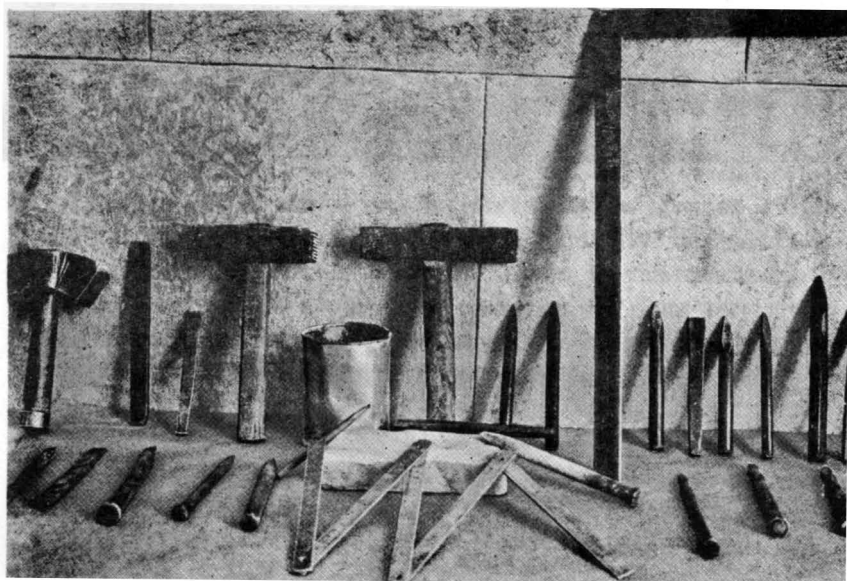


Fig. 2. Reed-mat huts. Process of weaving the mats.



a b c d e f g h i k l

Quarrymen's tools: a. *šdqūf* (quarrymen's dressing hammer); b. *nuḥl naqr* (steel drilling rod); c. *šdkūš* (small hammer); d. *mahaddeh* (large heavy hammer for breaking large stones; it is not pointed as Hava, p. 810, says); e. *ibrit naqr* (drilling needle); f. *qatṭā'ah*, called by some *rās* (pick hammer); g. *mal'aqah* spoon); h. *fās* pickaxe); i. *ma'bā* (blunt steel rod); k. *nuḥl (i)mqāwabeḥ* or *qōb* (crow-bar); l. *madjrafeh* (larry).



a

b

c

d

Stone-dresser's tools: a. *maṭraqah* (dresser's hammer); b. and c. *maṭabbah* (bush or granulating hammer); d. *zāwīah* (set square). Pointed (*ṣōkehī*) and flat (*yazmīl*) chisels of different sizes are also shown.

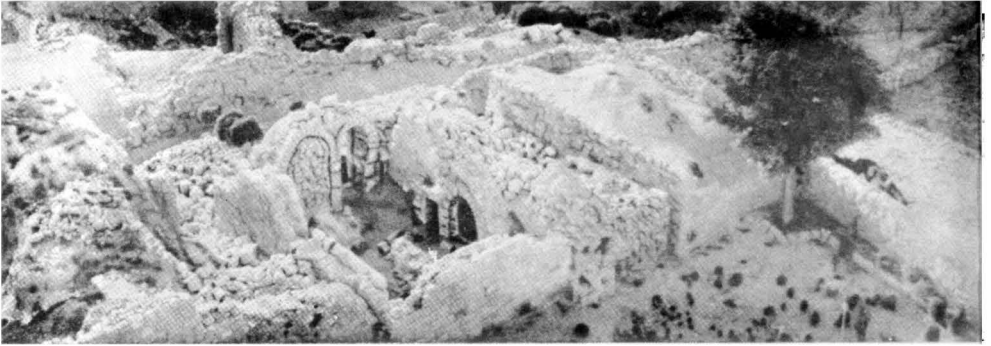


Fig. 1. A house in Nebi Şamwîl in process of building. It shows the crescent-shaped walls, ready to be vaulted.



Fig. 2. *Nawar* (gypsies) sharpening tools in the most primitive way.

This pointed dressing calls also for an even surface. *Talfiṣ*, medium and fine, may often resemble very closely the (*i*)*msamsam*. A coarse pick dressing is known as (*i*)*msamsam ḥiṣn* or *fūleh* and the finest quality as (*i*)*msamsam simsmiyeh*, while the medium quality is called *imsamsam ʿadasiyeh*. If a stone is to receive a rubbed face (*yndjli*) it must first be treated by the finest *maʿjabbeh*. A polished face is called *lammī*^c. The working of an (*i*)*msamsam* stone with the coarse bush hammer is called *bidardis el-ḥadjar*. A chisel-drafted margin of any dressed stone is called *zamleh* and when the margins are distinctly sunk into the face of the stone the stone-dressers speak of *bandjūr* (framing, sinking). Peasants formerly used *ḥadjar ḥām*, *talfiṣ* or *ṭubzi šaff* dressing for their buildings. The softer kinds of stone, *kaṣkūleh* and the soft kind of *malakeh*, are at times sawn with a strong saw, called *sārūqah*.¹

The dressing of stones usually takes place on the site of the building and not in the quarry.² Architects to-day buy stones in a dressed condition, which dressing is done in the quarry itself.

Many peasants do not need to quarry at all, since they either take the stone from some neighbouring ruin, or build their houses with large field stones which are only roughly shaped. This, as will be seen later, is the case in the plain. The remains of certain ruins have thus been completely pulled down. The peasant does not exercise any skill in selecting stones for building purposes. Any stone found on the site or near at hand is utilized. Town dwellers, on the other hand, usually specify the type of stone desired.³

3. *Burniug Lime* (šīd)

Stones are burnt into lime in a *lattōn*⁴ (kiln). A small kiln is known as *kabbārah*. *Yahūdi* stone makes the best lime, *mizzi ḥilū* comes next. The latter often contains layers of softer stone, which is not changed by fire in the same way as the parent-stone. These adulterations are called *banādīq* (the pl. of *bandūqah*).⁵ The lime

¹ 1 King 7¹.

² The same conditions prevailed in Talmudic times, KRAUSS, l. c., vol. I, p. 12. ³ Such is the case in Ḥalāṣa, Ruḥēbeh, and elsewhere.

⁴ The classical word is *ʿatōn*.

⁵ *Muḥīṭ* explains the verb *bandaqa* as "not ripening"; *bandūq* = bastard.

of the *ka'kūleh* stone is of poor quality. There is a saying that *quwet eš-šid bīrdja' la 'abūh*, "The quality (lit. the strength) of the lime depends (lit. goes back) upon (the hardness and quality of) its father (-stone)." While the colour of the lime of the *yahūdī* stone is a greyish white, that of the *mizzī hilū* is bright white. Such *šid* is used as a figurative term: *'abiad mi'l eš-šid*, "As white as lime." Since *nārī* stone does not turn into lime under the influence of fire it used to be employed for ovens and Turkish baths.

Irregular stones, preferably with natural depressions and holes (*ḥurrām*),¹ are chosen for the kiln, which is hermetically sealed. Specially experienced workers are entrusted with the building of a *lattōn*, for if not properly constructed its stones will not all be burnt equally well, or the whole kiln will collapse during the process of heating. A round pit, the circumference of the proposed kiln, is dug to a depth of 1—2 metres. The walls of the *lattōn* begin at the floor-level of the pit. When they rise above the ground they are covered as high as possible with earth to ensure their being hermetically closed. The upper part of the kiln is vaulted. An elongated stone placed perpendicularly, the *rāhib*, closes the central peak of the vault. This expression, the *rāhib*, means, literally, a monk. The Moslems, who formed the majority of lime-burners in the Jerusalem district, used this term to revenge themselves on the Christian stone-workers who, as we saw earlier, called one of their implements the *qāḏī*. The kiln-workers may often be heard shouting: "The *rāhib* is burning," "The *rāhib* is in flames," "May God damn the *rāhib*," and the like. Moslems and Christians now use the expressions *qāḏī* and *rāhib*² unconscious of their origin.

Every *lattōn* has two openings (*bābēn*) at its bottom, one for heating (*hazzr*) and one for ventilation. While the first, the *hazzār*, may be placed at any side of the kiln, the second, the *mansafāh*, must come in the west wall. It lies at the same time at a lower level than the *hazzār*.³ A large flat stone, the *zallāqiyeh* is, in

¹ Although *muḥīṭ* does not record this meaning of the term, the verb *ḥarama* signifies to slit, to crack, to perforate.

² In *muḥīṭ* we read (p. 585) *الراهب في صناعة البناء الحجر الذي يخبث به نصف القطرة المستند الى حائط لدعمه*. The sense given in the text is unknown to *muḥīṭ*.

³ Neither *hazara* nor *hazzār* is known to *muḥīṭ* in this sense.

Trans-Jordan, placed at the lowest side of the *hazzār*. Its upper surface has a decided slanting inclination, and thistles and other fuel slides easily into the *lattōn*. According to the size of the kiln it must be heated, day and night, from three to six days. 700—1000 *kabbās*¹ *nats* are used for a small, and 2000—3000 for a large *lattōn*. A *kabbās nats* is a heap of thistles such as constitutes a single person's load. Weeks before the kiln is heated men and women are busily occupied in gathering thistles and other weeds from the surrounding hills and mountains. Before ending a day's work the heaps of thorn-bushes gathered that day are brought near to the kiln.² This practice of uprooting thistles for kilns, as well as for household fuel, has denuded the mountains and hills of the only vegetation which serves to hold in place the surface layer of earth, since Palestine has not now any forests; thus in recent centuries the heavy winter storms have washed down the earth from the mountains and so exposed the bare rocks. After the *rāhib* becomes red the kiln fire must be fed for one *faṣl*. This sign is an indication that the stones have been sufficiently burnt to change them completely into lime. They say *ihmarr er-rāhib istawa l-lattōn*, "The *rāhib* is become red: the *lattōn* is sufficiently burnt (lit. is ripe)." A *faṣl* is twelve hours, and the workers speak of a kiln that needs six, eight, ten or twelve *fṣūleh*,³ i. e. three, four, five or six days of heating. After the period of heating is over the kiln is left from four to six days to cool. The *ṣīd* is now ready to be gathered and used.⁴ Two main qualities of *ṣīd* are distinguished⁵:

1. *Ṣīd rās* denotes large pieces of stone which are burnt thoroughly and which remain in large lumps after burning. It is the better quality and costs at present about 500 mils (= 10 shillings)

¹ *Kabbās* is unknown to *muḥīt* in this sense.

² The same process of burning lime seems to have been practised in biblical times, as may be inferred from Is. 33¹².

³ The term *fṣūleh* is also used for the four seasons of the year and for the period of time during which a person uses the water of a spring to irrigate his garden.

⁴ The process of burning lime was the same in Talmudic times (KRAUSS, l.c., vol. I, p. 18).

⁵ Lime is referred to several times in the Old Testament: Is. 33¹²; Amos 2¹; Deut. 27²; Dan. 5⁵.

per *qunṭār* (= 100 roṭls, or about 300 kg.). When exposed to the dew for a long time it falls into smaller pieces which have a white colour.

2. *Ṣīd rahīṭ*¹ is the powdered lime gathered from the interior of the kiln. It is as pure a quality as the *ṣīd rās*, the *qunṭār* costing about 400—450 mils (= 8—9 shillings).

Many adulterate the *ṣīd rahīṭ*, while it is still hot, by mixing it with white earth, *ḥuwar*. Although such an adulteration looks exactly like pure powdered lime it does not possess the same binding properties. Quicklime is known as *ṣīd ḥaiy* or *ṣīd faḥl*, slaked lime as *ṣīd maṣṣī*.

4. *The Cistern* (el-bīr)

A cistern is dug by every peasant before he begins to build his house.² Owing to the geographical conditions of Palestine every village which is not situated in the direct neighbourhood of a spring needed and still needs its own cisterns in which the rain water is stored. Villages near a spring, e. g. Battīr, Dēr Nẓām, Nabī Ṣāleḥ, Till, Aṭārah, do not need cisterns. The water serves for drinking, for washing, and for watering the animals. Cisterns are either public or private. The former are ancient cisterns used at present as *maṣāʿ* by all members of the village. They are found on the border of the village and in the fields and, as in ancient pastoral life, we may still see how flocks and herds gather round them.³ A private cistern remains the private property of the landlord.⁴

A cistern is usually dug one year before the construction of the house. This has two advantages: the stored rain water of the first year serves for the needs of building; and the water which in the first year is brackish becomes drinkable in the second year. If the rock is of a hard quality the excavation is done by blasting; if soft (*ḥuwar* or *nārī*) it is cut out, in which case the cistern is

¹ *Rahīṭ* is unknown in classical Arabic in this sense.

² The same custom was practised in ancient times. Mesha, king of Moab, says (l. 24 of the Moabite Inscription) that he had ordered every house of the city Karḥah to have a cistern (BENZINGER, *Wasserbauten*, Realenzyklopädie für protest. Theologie und Kirche, vol. XXI, pp. 11 ff.).

³ Gen. 24²⁰; 29² f.; Ex. 12^{15, 16}.

⁴ II Sam. 17¹⁸; II Chron. 26¹⁰; Deut 6¹¹.

pear-shaped in form and is called *bīr* (*i*)*ndjāṣah* or simply (*i*)*ndjāṣah*.¹ The 'Azāzmī Bedouin of the Negeb dig at the lower part of two adjacent hills such pear-shaped cisterns which they call *hrābeh*.² These are not plastered. They will hold the water since they are dug in an impervious bed of earth or clay.

In villages and towns the cisterns are usually dug in the court of the house (Pl. XIII, Fig. 2).³ At present, owing to lack of space, most town-dwellers dig their cisterns below the house itself. They open on the outside. In the houses of leading *ṣēḥs* *ḡiqā'iyūn* (cf. below) and in some old buildings of the city most of the cisterns were excavated below the house, the door opening into one of the lower rooms (Pl. XIII, Fig. 1). All Palestinians believe that sleeping rooms immediately above a cistern are unhealthy. This belief has arisen owing to the way in which cisterns are made. They were formerly dug exactly below ground level, and the unplastered roof did not rise above the surface of the surrounding ground, so that the cistern had no overflow; when it was full the dampness penetrated the roof, which also constituted the floor of the house. Cubic cisterns had to be vaulted, the barrel vault (*djamālōn*) being the usual form. At present steel joists have been introduced. Often rock-hewn tombs and natural caves are converted into cisterns.

The plastering (*qṣārah*) of a cistern differs from that of houses. The rough walls are first covered with a layer of small flat pieces of stone or pottery, which are fixed on with mortar made of lime and ashes. In this way the rough walls are rendered more even, requiring less plaster. This process is called *ṣahfet el-bīr*, *rakket el-bīr*, or more rarely, *ṣaqfet el-bīr*. The proper plastering material is composed of two layers, a lower coarse layer, the *marṣeh*, and an upper layer of finer material, the *nā'meh*.⁴ In the first layer coarsely crushed pottery, *ḥumrā*,⁵ is used, and in the upper layer,

¹ This seems to be the oldest type of cistern (BENZINGER, l. c.).

² CANAAN, *Die 'Azāzme-Bedouinen und ihr Gebiet*, ZDPV, vol. 51, p. 99. The term is unknown to *muḥīl* in this sense.

³ II Sam. 17¹⁸.

⁴ The verbs are *maraṣa* and *na'ama*.

⁵ Fifteen years ago one could see people squatting on the ground in *birket es-sultān*, Jerusalem, and crushing pottery in *ḥumrā*. This once profitable industry has now lost its importance.

finely crushed *humrā*. The last layer is rubbed over with oil (*madlūkeh (i)bzēt*) until it becomes smooth and hard. The plastering material is made of equal parts of *humrā*, *šād* and ashes. At present a finely trowelled cement layer has wholly replaced the older method. The older method was doubtless the better one, since it formed an impermeable sheet of concrete mass which adhered firmly to the wall¹; but it has the disadvantage of being more expensive and of taking more time for its completion.

A small pit is excavated in the direct neighbourhood of the cistern. Its interior is plastered in the same way as the main cistern. At about half of its depth the sump-pit, *el-misfāi*, is connected with the cistern by a plastered canal. The rain water gathers first in the *misfāi* and after settling it flows down the cistern. A large dry thorn-bush is placed at the external opening of this canal to serve as a screen or filter for the water. Large field cisterns have no such sump-pit. The top of the cistern is closed by a large stone which has a circular (less often a square) opening, *ḥarzet el-bīr* (Pl. XIII, Fig. 2).² The opening of the *ḥarzeh (bāb el-bīr)* is, in the better class houses, closed with an iron door (*bāb šādij*) or with an iron net door; but in most cases a large stone was rolled over the mouth of the cistern (Gen. 29²). *Ḥarzet el-bīr* is often nothing but the base of an ancient column in which a circular opening has been chiselled out. In some cases the opening is built of several stones giving *ḥarzet el-bīr* a square form. The cistern opening is large enough for a man's body to pass through, thus enabling the owner from time to time to descend and clean out the cistern. A large cistern is called *bīr bhēri*. The word *sahrīdj* is known but not much used.

There are, around the openings of most public cisterns, stone basins or troughs (*djurn*, pl. *djrūneh*)³ for watering animals. Old ossuaries and hollowed-out capitals are sometimes found serving this purpose. Cisterns of the older type had no overflow.

¹ Is. 2¹⁸ (broken wells).

² A proverb to the effect that with perseverance even difficult things are attainable, runs: *el-ḥabl 'alā-i-tekrār biqtā' ḥarzet el-bīr*, "With time (lit. continuous repetition) the rope will cut through (the hard stone of) *ḥarzet el-bīr*."

³ The word *djurn* means also "threshing-floor," *djurn (el-kibbeh)* "mortar," *djurn (el-ma'mudiyeh)* "the font."



Fig. 1. A cistern built under a house, and opening in a room of the lower story.



Fig. 2. A cistern in the court of a peasant's house.



The cisterns are fed by rain-water running down from the roofs as well as by that drawn from the surrounding area. Naturally such water cannot be absolutely pure. In field cisterns the water is drawn from the fields and roads. Channels (*qunī*, the pl. of *qanāi*) running from all directions lead the rain-water into the cistern.

(to be continued)