

THE CONSERVATION OF GRAIN AND THE FORTIFIED GRANARIES FROM THE MAGHREB TO CENTRAL EUROPE

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1. Introduction

The study and comparison of different societies and cultures not only enlarges our scientific knowledge, but helps foster a better spirit of understanding and tolerance, for which today there is such a great need¹.

In 1987, we started an archaeological investigation on the medieval (Muslim, Mudejar and Christian) settlement in the valley of the middle Segura and its historical region of the *Valle de Ricote*, in the Spanish autonomous Region of Murcia. This research combines rural as well as urban archaeology (*De Meulemeester 1990, 242-244; De Meulemeester - Matthys 1992, 115; 1995; Amigues - De Meulemeester - Matthys 1992; forthcoming; Bazzana - De Meulemeester - Matthys forthcoming; Bazzana - De Meulemeester forthcoming*). The aspects of the rural settlement are studied through examinations of the different castles² dominating and/or controlling the valley, through the investigation of the irrigation systems, through the location and study of the habitat and finally through the investigation of a fortified granary. The latter constitutes the main subject of this article. The excavations of the 13th century fortified Muslim granary of the *Cabezo de la Cobertera* formed a starting point for an ethno-archaeological analysis of the former Berber systems for long-term conservation of grain on the one hand and it made it possible for analogue systems in the Christian world to be studied.

2. Fortified granaries in the Maghreb

The final goal of ethno-archaeology is to clarify, by the way of an ethnological detour, a number of archaeological facts, that cannot be explained otherwise (on ethno-archaeology see *e.g. Delaigue 1992*). Ethnology adds to the often lacking archaeological description: volume and real-life, observation on a real scale (*Bazzana 1992, 17*).

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- 1 This study is part of the research programmes of the Casa de Velázquez in Madrid, of the UMR n° 5648 (= Mixed Research Group of the French CNRS and university of Lyon II) and of the Ministry of the Walloon Region, Heritage Departement - Direction de l'Archéologie (Belgium). During the excavations we were able to count on the collaboration of François Amigues (CdV, currently at the university of Perpignan), also in charge of the ceramics study.
 - 2 We use the term "castle" for convenience; we are aware that the Islamic castle has a different juridical and social, even military character than the one given to the feudal "Christian" castle, which we can define as the fortified private residence of a nobleman, with no hierarchic connotation.

North-Africa developed different ways for long-term conservation of grain, depending on the structure of the society, which can be nomadic, semi-nomadic or sedentary. In Tunisia (Louis 1979, 205-214), nomadic tribes living tents stock their grain reserves close to their fields guarded by a paid ward. They keep the grain in reed baskets in shaped like great jars as well as in silos; they are excavated by the guard, have a cylindrical shape and are mostly not more than a meter deep and wide [In other regions form and dimensions are different: Vignet Zunz 1979, 215 (Ouarsenis/Algeria), 219 (Chad)]. "The custodian guards the grain not only against any sort of depredation, but also against the improvidence of women, who get, in their tents, only the necessary grain for nourishing their family". The fear of female waste makes a Tunisian semi-nomad say that "everybody wants his grain well aerated, but away from the women" (Despois 1953, 58; Louis 1979, 208).

In Tunisia, semi-nomads stock their grain for direct consumption in their houses, while the rest is stored in collective granaries, composed of individual cells called *ghorfa*, which originally only represented a store room added to the flat rooftop. Sedentary people use baskets stored in the courtyard of the house as well as the common granaries. When there are no external factors of insecurity, they might choose to build a domestic granary of the *ghorfa* type, annexed to the residence (Ferchiou 1979, 191). This type of construction has survived in some of the Andalusian mountain villages, where the store room on the rooftop is called the *camara* (Delaigue 1988, 75-76).

The evolutionary pattern of the morphology and function of the granary-refuge from nomadic lifestyle to a completely sedentary system was defined by R. Montagne (1929, 203-204) as follows:

- 1) nomadic lifestyle: excavated secret storage places or rock shelters
- 2) semi-nomadic lifestyle: cliff caves on superimposed lines
- 3) later family storehouses build as centres of permanent establishments
- 4) with the pre-sedentary tribes: villages around guarded storehouse
- 5) finally with the fully sedentary: the *agadir*, the village or even district granary becomes an institution, which develops along with traditional customs, and even a commercial centre and a market place;

As far as the Cabezo de la Cobertera is concerned, it is the *agadir* we are most interested in. It is a more or less spacious structure where Berbers store their crops and other important belongings.

The need to construct granaries is due first of all to the climate. In those semi-dry regions on the edge of the Sahara, the harvesting of cereals cultivated on dry land or irrigated by temporary small streams only, is very irregular. In good years crops may be abundant, but often the harvest is poor or even inexistent. So people have to store in anticipation of periods of famine (Despois 1953, 47). This forethought forms the basis of the construction of the granaries. To those climatic reasons are added those of the continued threat of plundering by neighbours in search of food during periods of bad harvest. The grain has to be defended.

The worst enemy of those common fortified granaries and of the spirit of freedom they represented among the Berber tribes was the central government, the *makhzen* (Adam 1950, 330-331). A tribe was only subdued after the destruction of its granary, symbol of its economic, but also political independence and of its cohesion, and often a very efficient defensive recess. When in the 19th century, the Turks repressed a revolt in Tripolitania, they destroyed all the granaries of the Djebel Nefousa to overcome the locals (Despois 1953, 56). The decline of the traditional common granary came when the Maghreb was pacified by the French; it lost its "raison d'être": no insecurity, no need for fortified granaries. Until recently, the last granaries in operation represented a meeting place and centre of community life for the villagers who build them; they were what the pub opposite the church represent (or represented) in our western European villages (Despois 1953, 58; Jacques-Meunier 1949, 135).

Depending on the area or region it is called *ksar* (Louis 1979; Ayoub - Le Quellec 1981) (southern Tunisia, Tripolitania-Libya), *guelaâ* (Despois 1953) (Aurès-Algeria), *kasba* (Capot-Rey 1956) (Sahara-Algeria), *aqrar* (Montagne 1929; Pereda Roig 1939) (northern Morocco), *tirghemt* (Mikander 1986) (southern Morocco) or *agadir* (southern Morocco). Some dominate the villages, other are isolated from the actual settlement and crown a rocky piton. Those granaries are present from Tripolitania to Morocco, where they are best preserved and better studied than in other parts of northern Africa (Despois 1953, 38). In this article we shall have a brief look at the *ksar*, the *aqrar* and the *agadir*.

3. The ksar in Tripolitania and in southern Tunisia

The Tripolitanian and south Tunisian ksar constitutes a fortified granary composed of a number of store cells superimposed on two to five levels. Those cells, called *ghorfa* are arranged around a central courtyard, their outer walls forming a curtain wall, which can only be crossed by a single protected and defended doorway. One *ksar* may consist of several granaries, each of them organised around their own courtyard.

In contrast to the granaries of other regions, the *ghorfa* has a vaulted roof. "They are small and narrow rooms, low and elongated, which have more of a corridor with an average length between three and five meters, a width of 1.50 m and a height which never exceeds 1.20 m. You enter through a small porch not higher than 70 cm". Whoever keeps his cereals in the *ghorfa* must be either its owner or its tenant. Those who cannot use one of the *ghorfa* cells, can store their grain in baskets or reed carrycots placed in the central courtyard, where they will be guarded.

In Tripolitania, oral tradition dates those granaries back to the 14th century.

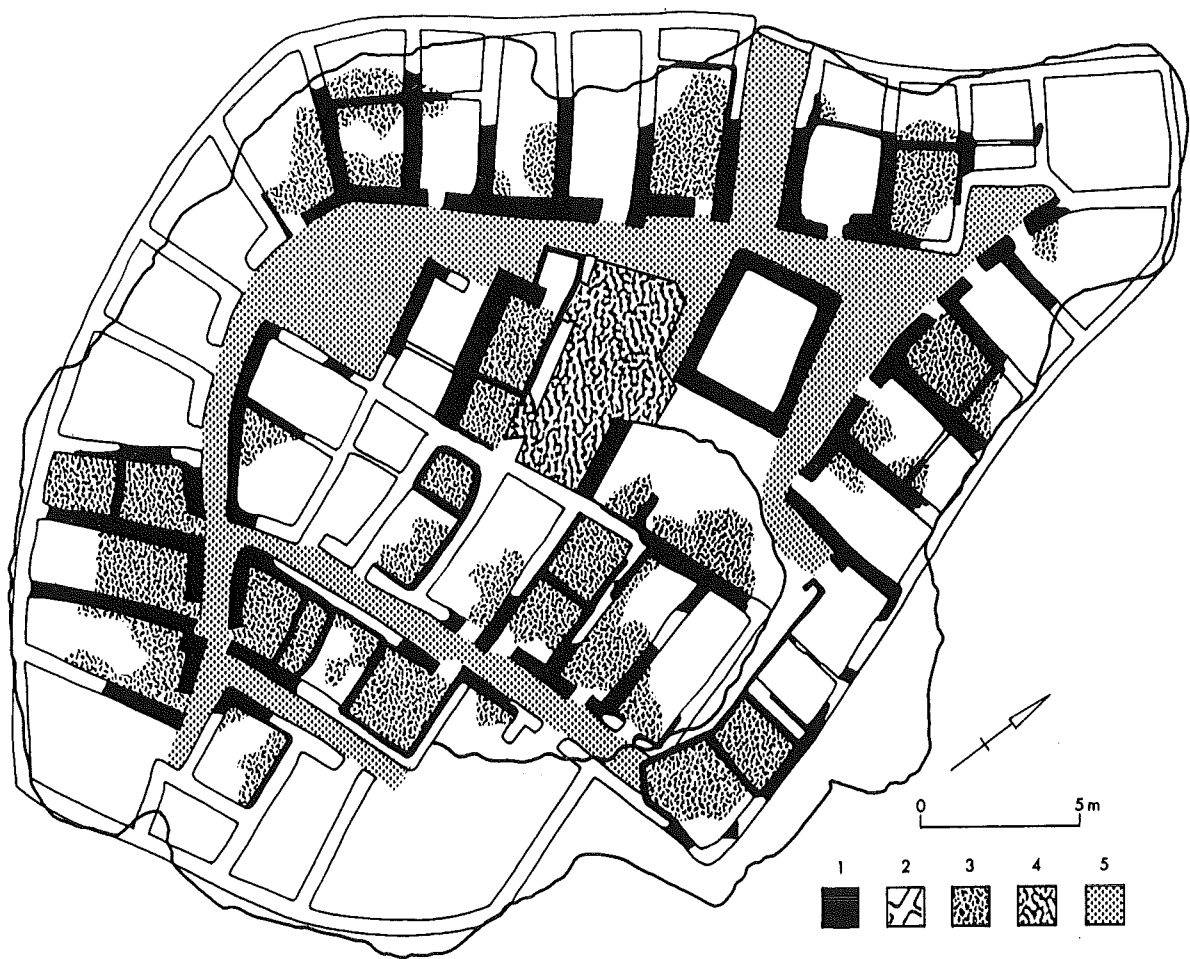


Fig. 1. Cabezo de la Cobertera. Map of the agadir in the 1st half of the 13th century according to the excavation results. 1. Preserved tal-pial walls; 2. redrawn walls; 3. preserved floors; 4. area with the common building; 5. circulation layout.

4. The aqrar in northern Morocco

The *aqrar*, the collective Berber granary of northern Morocco is different from the granaries in other parts of the Maghreb. It is composed of individual storehouses called *heri*, which measure some 3 m by 1.50 m - 2 m and are 0.50 m high; they are small wooden buildings constructed on ladders, which isolated them from the ground, and have a stubble roof. Each family has an *heri* and together they form a small village established on a summit. With some defences added and guarded by a ward it becomes a fortified collective granary where, in case of danger, women and children and their herds find refuge. *Pereda Roig's* (1939) description is most eloquent: "To arrive at the granary, you need half an hour on horseback and quarter of an hour on foot by goat trail. The access to the granary is controlled by the guard and its dog. There is only one entry, the rest of the piton is inaccessible. In case of a possible razzia, the villagers brought their valuable possessions over there together with the livestock, the women, the children and the disabled old man. The man returned to the village to defend it, while the women were able enough to defend the granary which could stand a long siege".

5. The agadir of southern Morocco

The *agadir*³ of southern Moroccan forms an institution established by the tribe or the clan, where every head of a family has the key to an individual cell. The storage cells and their outbuildings are guarded by the doorkeeper, who controls the coming and going of granary users and forbids entry to strangers. The word "*agadir*" presumably comes from Phoenician "*gadir*", which means "wall".

Frequently the granary is also a fortress, including watchtowers and situated at inaccessible locations.

Those *agadirs* have a narrow central alley, limited by the grain stores, which have the same dimensions.

The flat roof is made of earth. Protruding flagstones fixed in the walls at different levels serve as steps to reach the stores at higher floors. Sometimes, indented trunks make it possible to reach the upper floor cells.

Each store has only one wooden door, which opens inwardly and except for a few ventilation orifices, there are no openings in the cell walls.

The dependencies vary in number and importance; besides the porter's lodge, there might be a mill, a smithy, a stable, a meeting room, or even a small mosque. An important *agadir* always has one or more cisterns.

The curtain wall, with its *chemin de ronde*, can be fortified with a few watchtowers. One entry through the wall, in zigzag or fortified, gives access to the granary.

The chosen ground is divided in equal plots; the floors are drawn by lot. One single family may have more than one cell, built by themselves; they have to take care of it and keep it in good shape, as its deterioration will harm his neighbours' interests. The common parts of the granary are in the community's charge, constructed and cared for by shared tasks. The owners choose a guard or porter, permanently attached to the granary and care for his subsistence.

The *agadir* is sacred just like a saint's tomb or a mosque. No wrong doings are committed in the granary: no thefts, no lies, no adultery or murder; the granary is inviolable and constitutes an asylum.

The sacred nature might emanate from different sources. So it might originate from the maraboutique protection to which the granary is often vowed. But, on the other hand, it is quite likely that the substrata of this belief are older than Islam itself. Grain is sacred in itself, because it is the source of life. So is it acceptable that it is the stored grain itself that lends its magic power and the sacred inviolability it causes to the granary. When deals were concluded inside the granary, it was certainly done there to give the contracts this sacred protection.

3 We compiled several works: *Adam* 1950; *Dupas* 1929; *Jacques-Meunier* 1949; 1951; 1962; *Montagne* 1929; 1930; *Mikander* 1986. Most information was taken from *Djema Jacques-Meunier* (1949) the basic study.

The origin of the common granary remains obscure, the time and place of its emergence being unknown. North-Africa only testifies to its existence. The organisation and operating of the *agadir* are based on traditional law. The oldest known charters date back to the 16th/17th century and are written in Arabic. The excavations at the Spanish *Cabezo de la Cobertera* change the chronological picture and put back the chronology by at least three centuries.

Actually the common granary might appear to be a typical Berber institution but, as we shall see, other regions show similar traditions.

6. The Cabezo de la Cobertera and its agadir

Our starting point, the Cabezo de la Cobertera, forms an isolated mound in the middle of the valley of the rio Segura, which flows through the autonomous region of Murcia in south-eastern Spain. The excavated structures on the hilltop can only be explained as the storehouses of a fortified granary of Berber tradition; it dates back to the 13th century and to the period just before the Christian conquest.

The plateau of the Cabezo, some 30 m by 40 m wide, dominates the stream by 100 m. With its steep slopes, its topography makes it possible to climb the site from the north-west side only; the other slopes are too steep.

The layout of the site includes some 30 structures occupying the totality of the plateau; in the centre some place is left over for an open area, a cistern, and an oratory.

Circulation inside the granary is possible through some pathways no wider than 60 to a 100 cm.

In general, the buildings are rectangular in shape (4 m to 5 m by 1.50 m to 2 m). Two types can be distinguished. A first group has a living quarter at the front of the cell and a storage box at the back separated from each other by a tiny vertically placed stone, which constitutes the 4th wall of the (grain) receptacle. A small wooden door (max. 60 cm) gave access to the inside. Often a large jar and a hearth were placed next to the door. A second group has no box, fireplace or jar; maybe this type of construction without the constructed storage box and living facilities was rather used to keep animals.

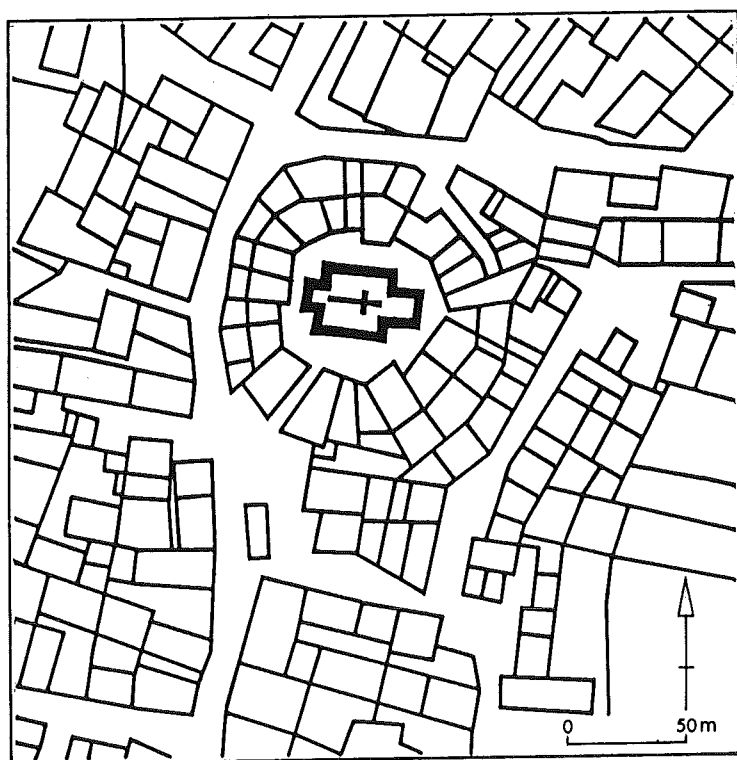


Fig. 2. Dossenheim. Cadastral map with the cellars around the church (after Metz 1989).

7. The refuge in Islamic Spain

Except for the Cabezo de la Cobertera, the *agadir*-system has not been recognised in the archaeology of Islamic Spain where in general the most typical rural refuge area is the castral *albacar* (Bazzana *et al.* 1988, 10-32; 1992, 338-340) a kind of large bailey. Castles (see Bazzana *et al.* 1988) as well as rural sites (see Bermúdez Lopez - Bazzana 1990) studies indicate that, *e.g.* at Uxò (Bazzana *et al.* 1988, 212-216 and 256; Bazzana 1990, 248; 1992, 260), Monte Marinet (Bazzana 1990, 248, 370; 1992, 261; Bazzana - Guichard 1988, 18), la Magdalena (Bazzana 1992, 261), Silla and Montroy (Bazzana *et al.* 1988, 121-122; as for Silla see Bazzana 1992, 261-262), some structures may have functioned as collective storerooms (Bazzana 1992, 346).

8. The "Christian world"

In Spain, the only structure comparable to the *agadir* is the Catalan *sagrera* (pl. *sagreres*) (Bonnassie 1975; 1994). These *sacrariae* are circular enclosures around a village church. It is the sacred area around the church, usually 30 steps in all directions, that benefits from the same protection as the church itself.

The role of the *sagrera* in the formation of the Catalan habitat seems to have been predominant and was, from the 11th century onwards an essential element in the evolution of the landscape. The *sacraria* evolved from a refuge granary into a village:

1) From the second quarter of the 11th century onwards, the occupation around the church resembles a vast collective granary with in the 30 steps circular area protected by canonical laws since Visigothic times. From about 1020 onwards, the Catalan region witnesses a rising number of *sacraria* at a time when general insecurity is growing as a result of violence through which feudal lords are trying to subdue a rural but independent community. In other words, the *sagrera* was born out of the fear for the castle and the violence and war it causes; in this sense there is no real difference between the Christian *sagrera* and the Berber *agadir*, as both were born out of insecurity and war.

2) Between 1030 and 1060, the storage cells became permanent living quarters.

3) Finally, the *sagrera* became a small agglomeration, where storage and housing were organised on both sides of one or two small streets. The *sagrera* became an ecclesiastical village constituting the central element of the agglomeration which eventually developed around it.

This Catalan rural - and in some cases even urban - development marks the origin of the circular villages (or town centres) of the Languedoc-Roussillon. Other regions more to the north experienced an analogous development (Fixot - Zadora-Rio 1989; Baudrel-Cazes 1994). The *cellaria* - in German *Keller* or *Gaden* - in the Alsace, Switzerland, Germany and Transylvania constitute the only village granaries still in existence, but in the Middle Ages, the system must have been extremely widespread. The *Gadenkirchen* in Transylvania and central Germany were built for storage from the beginning (Hinz 1982, 118, 120).

In the Alsace from the 12th century onwards, *cellaria* are mentioned inside the church enclosures. The villagers stocked their precious belongings, cereals, wine, textiles, etc., inside the *cimiterium*. Each farm possessed a cellar, which formed a crown against the inside of the enclosure wall. This formation gave shelter, though it did not necessarily function as an active fortification. The only example in the Alsace, where cellars are more or less preserved is in the village of Dossenheim. The *Kirchhof* there is surrounded by a circular sandstone curtain wall. Inside, a series of chambers, built against the wall, forms a crown around the church. They clearly have a storehouse function and each of them belongs to an individual family of the village community. Although the Dossenheim site is only mentioned in texts from the 15th century onwards, it probably goes back to the 13th century (Metz 1989, 21-23; Frey 1992).

Unfortunately, only a few of these cemeteries have been archaeologically studied. Recently, the archaeological research on the *Kirchenburg*, the fortified church and cemetery of Riehen, near Basel in Switzerland, was published (Thommen 1993, 133-137). In the 11th century, it was surrounded by a ditch and a

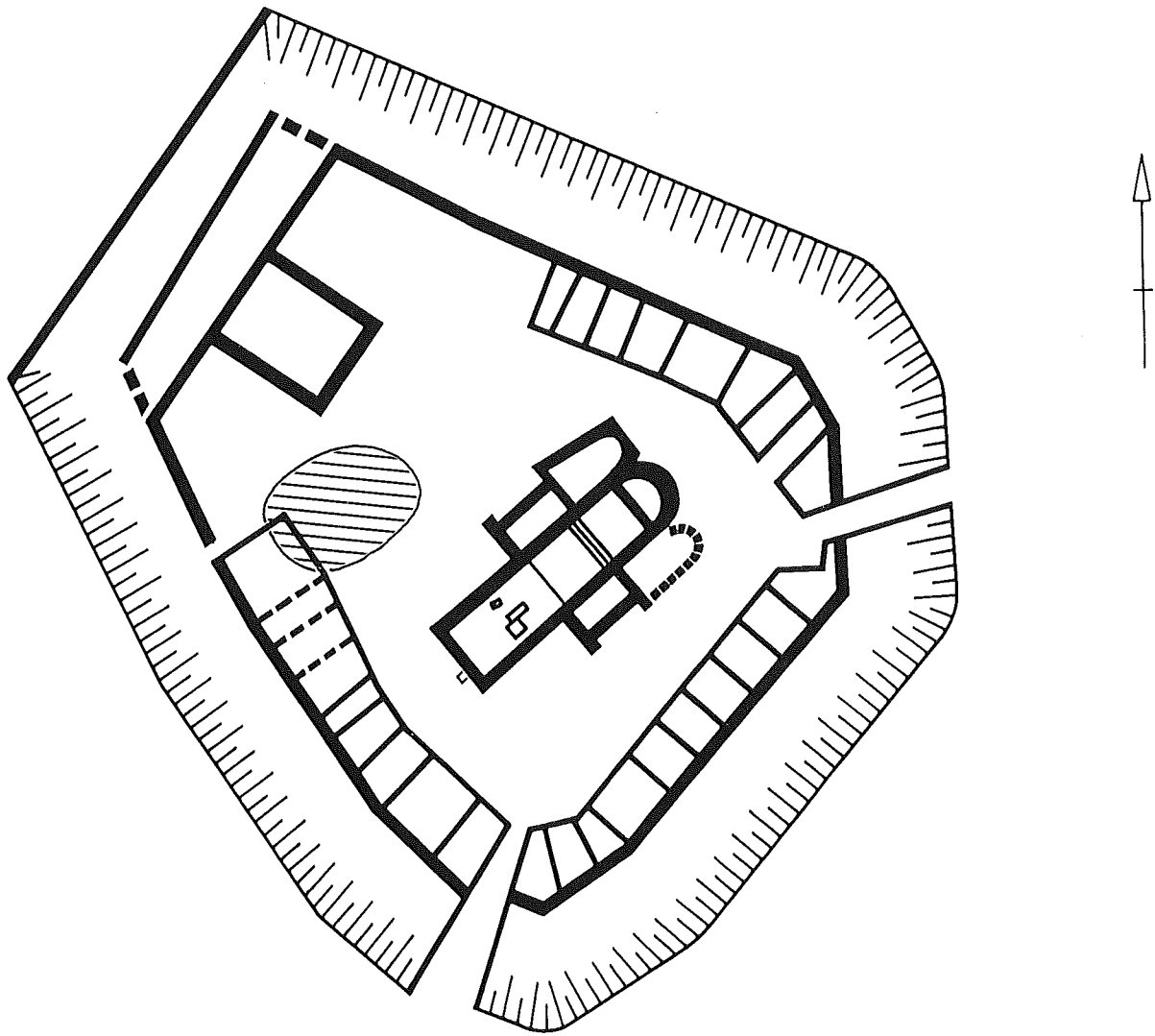
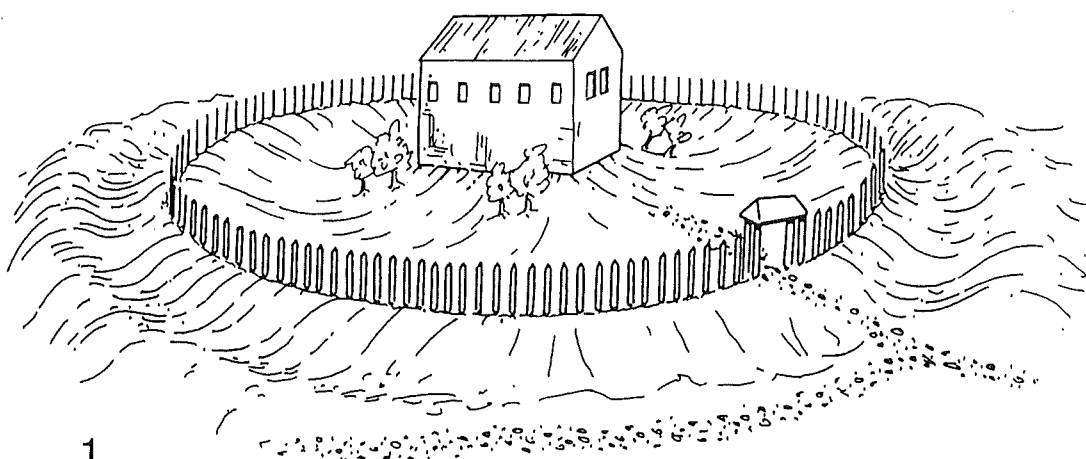


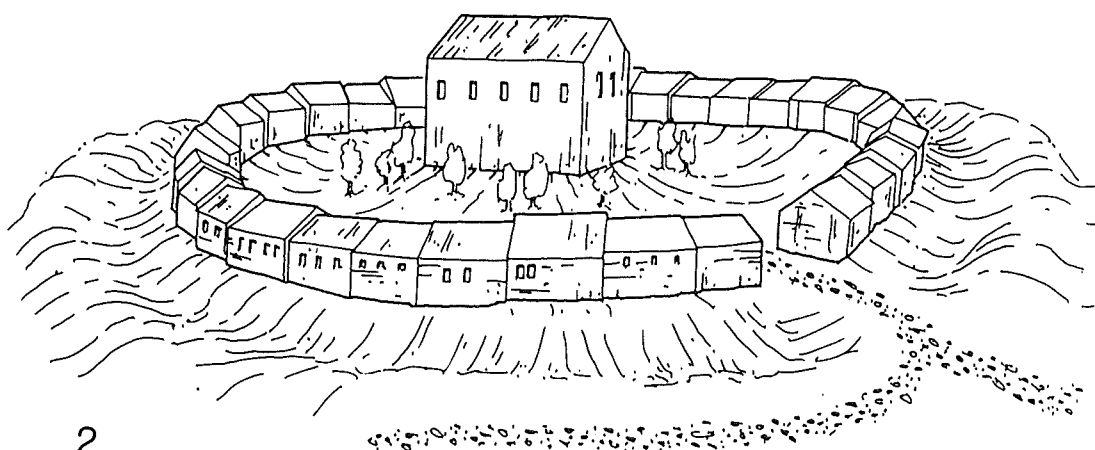
Fig. 3. Riehen. The *Kirchenburg* and the cellars around the church (after Thommen 1993).

rampart. In the middle of the 12th century, a semicircular crown of cellars leaned against the enclosure, leaving some open room for the construction of the seigniorial residence. Two gates provided access to the site.

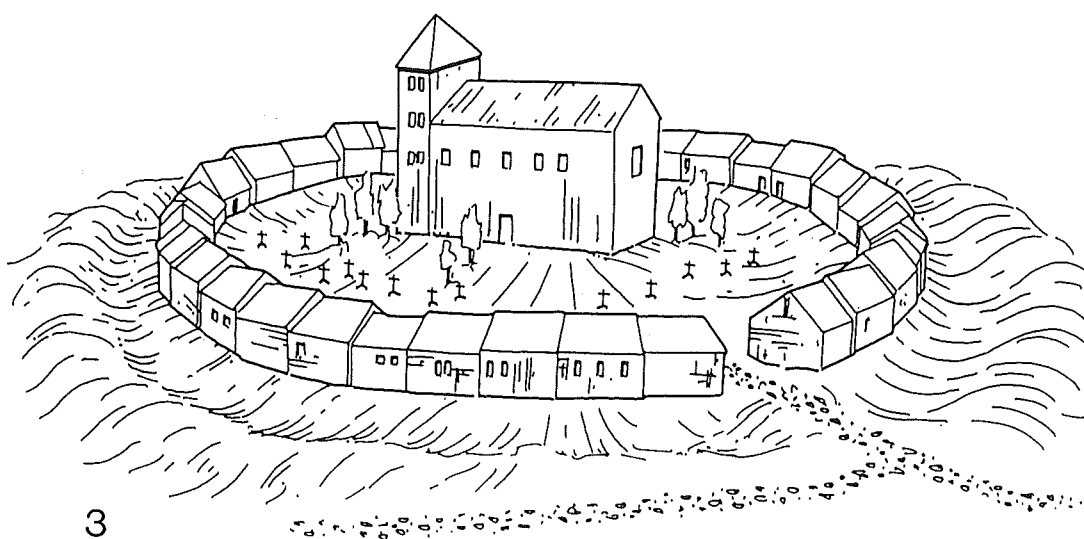
The best example studied through excavations is the German site of Köningshagen (Janssen 1965). In contrast with many other *Kirchenburgen*, the origin of Köningshagen goes back to a fortified site with a count's *aula*, a palisade and ditch dated back to the first half of the 12th century. Shortly before 1250 a crown of small houses of different superficies were built against the outer wall. In the middle of the 13th century, when the count's residence was transformed into a church, they lost their residential function and were converted into cellars and workshops.



1



2



3

Fig. 4. Köningshagen. From the count's castle to the Kirchenburg (after Janssen 1965).

9. Conclusion

At the Cabezo de la Cobertera we have a rural community, which - in the absence of a refuge system set up by the state - organised its own protection. Let us remember that the *agadir* was born out of "the coincidence of a certain rural economy and the fear of war" and that the time of insecurity which characterises the Almo-hade period probably pushed the Muslims of the Ricotian *huerta* to build the fortified common granary of the Cabezo de la Cobertera. The ethno-archaeological analysis of the storage systems in North-Africa shows that the site of the Cabezo needs to be explained as being of the *agadir*-type and as a site that corresponds to the normal rural settlement patterns of the Valle de Ricote and its cultivated fields irrigated by a string of *acequias* or water canals, built and maintained by the inhabitants of a series of *alquerías* or hamlets located on the edges of the *regadío* or irrigated plots, situated along the stream itself but dominated and above all controlled by the castles that protected the passages through the valley and especially the barrages that deviated and supplied the water for the hydraulic system.

Finally, the investigation shows that there is a certain analogy between the refuge granaries in the Berber and Christian regions. Apparently, such a defence or security system was closely linked to each rural society in search of the conservation and the protection of the produce of its harvests and of its defence against the unpredictable fluctuations of nature and the envy of its neighbours. The Catalan examples, and particularly the German site of Köningshagen demonstrate the direct link between the sacred area and the granary, as it was when the church was built that the houses were transformed into storage-rooms. Köningshagen proves this interaction for the Christian world; as for the Arabo-berber society, the ethnographical analysis leaves no room for doubt. When the marabouts and central cellars of the Berber granary are replaced by a church, a fairly similar general layout is seen to emerge; there is no fundamental difference between the Arabo-berber common granaries and the refuge-cemetery of the Christian world.

LA CONSERVATION DU GRAIN ET LES GRENIERS FORTIFIÉS DU MAGHREB À L'EUROPE CENTRALE

Dans la région autonome de Murcie, une enquête archéologique porte sur le peuplement musulman et mudéjar de la vallée de moyen Segura. Le peuplement rural s'y étudie à travers ses fortifications, son habitat rural, ses systèmes hydrauliques, son grenier fortifié. La découverte d'un grenier musulman du XIII^e siècle au Cabezo de la Cobertera fut le point de départ d'une étude ethno-archéologique qui permet d'ouvrir des parenthèses vers "le monde berbère" et vers "le monde chrétien" et d'étudier ainsi le schéma évolutif de la morphologie et de la fonction du grenier-refuge depuis la vie nomade jusqu'à l'époque moderne de la parfaite sédentarisation. En Espagne, la seule correspondance avec le grenier collectif du Cabezo se trouve dans les *sagres* catalans, développé à partir du XI^e siècle. Il s'agit d'enclos circulaires autour d'une église. D'autres régions plus septentrionales connaissent un développement semblable; les *cellaria* - en allemand *Keller* ou *Gaden* - de l'Europe centrale ont été construites pour y stocker les réserves.

KORNLAGERUNG UND BEFESTIGTE KORKAMMERN VOM MAGHREB BIS NACH MITTELEUROPA

In der spanischen autonomen Region Murcia begann man archäologische Forschungsarbeiten über die mittelalterliche (muslimische und mudéjare) Besiedlung im Tal des mittleren Flusses Segura. Die Aspekte der ländlichen Siedlungen werden durch die Untersuchung der Burgen, des Bewässerungssystems und des Lebensraums studiert. Die Ausgrabungen einer muslimischen befestigten Speicher des 13. Jahrhunderts auf dem Cabezo de la Coberta bildete den Ausgangspunkt für eine ethnisch-archäologische Analyse des früheren Berbersystems für eine langfristige Getreideaufbewahrung und ermöglichte das Studium analoger Systeme der christlichen Hemisphäre im Kontext eines evolutionären Modells der Morphologie und der Funktion einer Kornkammer von der nomadischen Lebensart hin zur völligen Sesshaftigkeit. In Spanien sind die einzig mit *Agadir* vergleichbare Struktur die katalanischen *sagres*, kreisförmige Umfassungsmauern um ein Dorf oder eine Kirche. Andere, nördlicher gelegene Regionen verzeichneten eine analoge Entwicklung; die *cellaria* - auf Deutsch *Keller* oder *Gaden* - baute man in Mitteleuropa ebenfalls zwecks Lagerung.

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