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"ANTONINO DE STEFANO

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Wādī Al-Usaykhim: Strategies of use and of Valorisation of the Desertic Land of al-Bādiya through the Archaeological Heritage

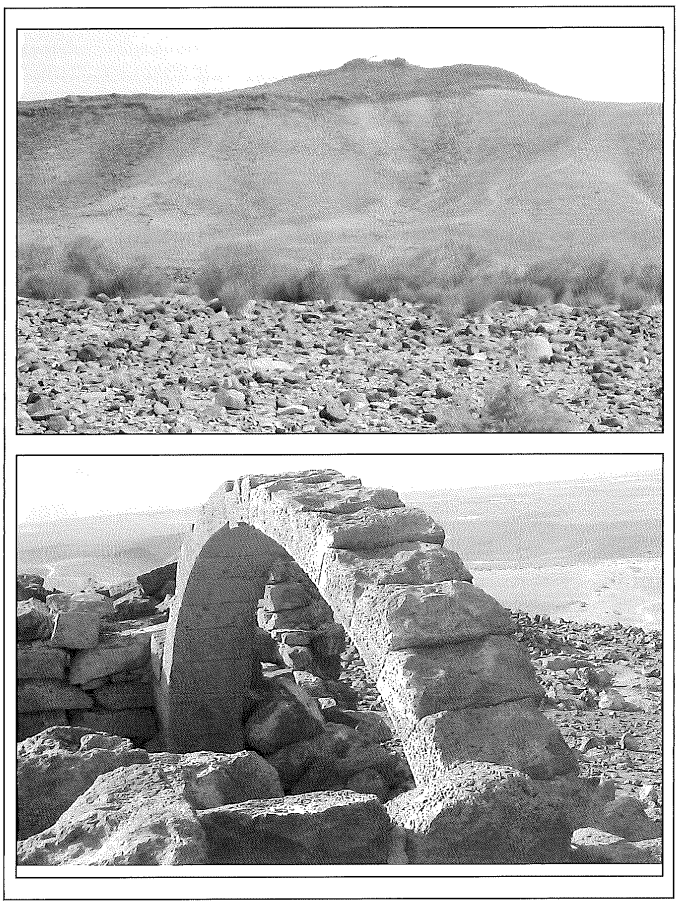
The Roman castle belonging to the *limes arabicus*, situated on a cone-shaped orographic mount (FIG. 1) constituted of limestone overlaid with basalt stratifications, is today called by the Bedouins of the area Wādī al-Usaykhim.

The castle is on top of Jabal al-Usaykhim, 641m. asl (FIG. 2). The castle faces south to the Wādī al-Usaykhim and northeast to the contemporary Qaṣr al-Azraq, which is approximately 19.2km away.

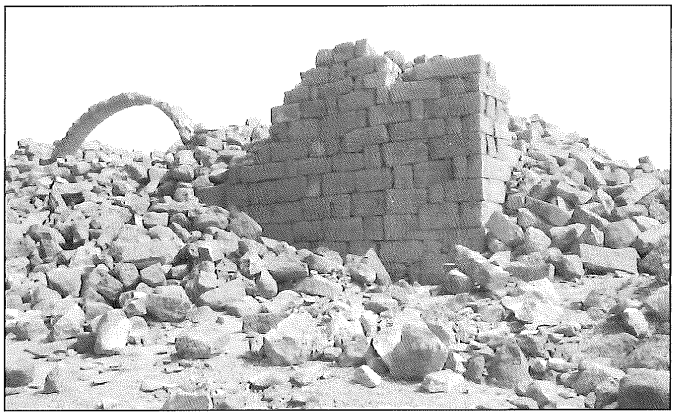
The remains of the Roman castle of the *limes arabicus* are made up of huge precisely-squared stones (FIG. 3), scattered around in a disorderly fashion. The primary boundary walls, of quadrangular shape (FIG. 4), belong to the first elevation of the castle (FIG. 5).

The Archaeological Excavations and Restora-

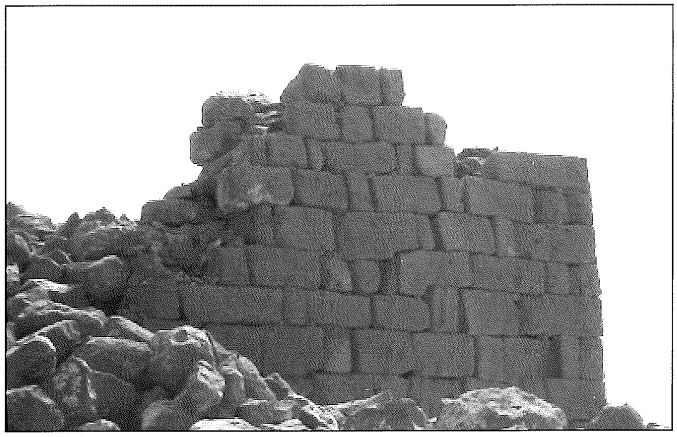
1. Arial Photo of the site.



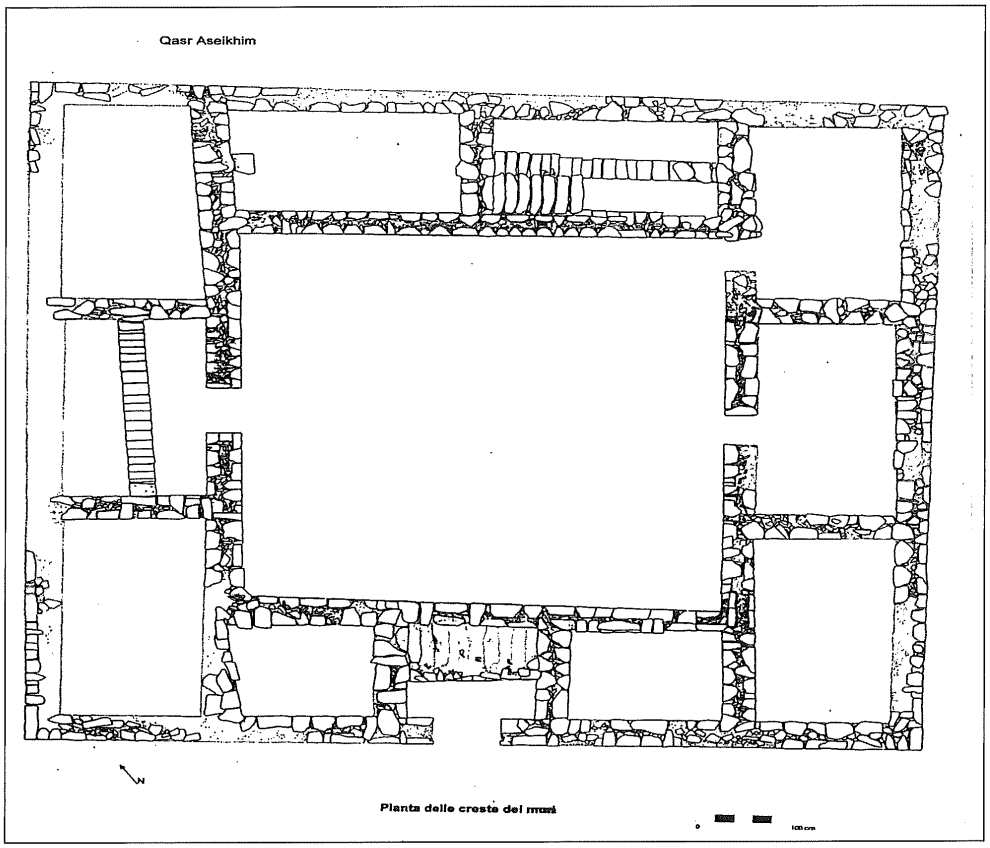
2. The Roman castle on the top of the hill.



3. The south western corner of the castle.



5. The first elevation of the castle.



4. The Plan of Qasr al Usaykhim.

risons lived side by side with the local population.

Al-Usaykhim castle itself was under the military control of al-Azraq castle, from which the Roman *Legio III Cyrenaica* oversaw the area. Along with Qaṣr al-'Uwaynid and Qaṣr Jawa, al-Usaykhim is believed to have been part of a complex military system to defend this part of the limes. The troops quartered there were probably auxiliaries of Arab origin.

It is known from historical sources that the fortifications were occupied by military garrisons until the fifth century AD; their abandonment was perhaps a result of the major earthquake that occurred sometime between 498 and 552AD. After that point, only the military settlements of al-Lajjūn, al-Fityān, and Yāsir remained along the *limes*.

During the course of our excavation, we have compiled a proposal for the conservation of the area, including the castle, which we delivered to the Department of Antiquities in 2003. We have proposed two possible funding sources for this project, the first being the Italian Cooperation. This solution would cost approximately €1 million, and would require extensive bureaucratic procedures. The other solution would be to restore only the Roman castle, with funding from the Department of Antiquities of Jordan and the Italian Istituto Superiore per le tecniche di conservazione dei beni culturali e dell'ambiente "Antonino De Stefano".

In 2003 we published a book titled: *Limes Arabicus*.

The Roman castle, situated along the *limes Arabicus*, was built on the highest hilltop in the eastern strip of the Arabian province. It is situated on a conical hill that dominates the underlying plain and overlooks the sinuous Wādī al-Usaykhim, which stretches out to the arid clearings of the Mesopotamian desert. The castle appears to have been built during the period when the desertification processes were beginning in the al-Azraq plain, and the environment was transforming from green savannah, full of water, to an arid steppe. From that time until the present, the arid landscape of al-Usaykhim has remained unchanged.

The Oriental frontier of the Arabian province had been under direct Roman control for a long time, and the army had already built the first military structures of the new alignment of the *limes Arabicus*. The reason for the shift in the alignment of the *limes* was a strictly economic one, linked to the control of the principal silk, incense and spices trade routes from the East. It was thus of specific importance the construction of a new *limes* would integrate the pre-existing one with the newer *Strata Diocletiana*. The conical hill of al-Usaykhim would have commanded an open view in all directions, much as it does today.

The landscape of the area also contains variation in both color and geology. The winding path of the Wādī al-Usaykhim crosses areas characterized by layers of cooled volcanic lava, changing into vast heaps of black basalt stones and finally into calcareous plain overlaid by a stratum of flints.

The colours are also unique in their chromatic variation: from east to north the black of the basaltic rocks is shaded with a whitish patina of lichen. From south to west the yellow calcareous hills are painted in red by a multitudes of red flints and punctuated with spots of white.

The plain below the al-Usaykhim hill has the same geo-morphological characteristics as the top. It is constituted of black basalt, while the declivity appears yellowish in colour because of the combination of calcareous conformation and the purple red of the flints. It was because of this chromatic variation the hill was named Usaykhim, which, in Arabic, means a strong change of colour from black to red.

The al-Bādiya around al-Usaykhim, however, is both full of life and rich in archaeological and historical heritage, including Bedouin settlements, rounded enclosures for domesticated animals and huge hunting estates used by the lords of the desert for hunting gazelles, foxes, ostrich, and other wild animals that once used to live in this area (before their extermination at the hands of aforesaid desert lords). The estates are built of dry-laid walls of basaltic stones of various shapes and sizes, with occasional square protuberances.

The arid environment must have been surprisingly active, with both people and goods crossing the frontier on a daily basis, while the vegetation and fauna were rich and blooming.

The Construction Technique of the Roman Castle of al-Usaykhim

The castle was certainly built from local stone. Remains of a quarry have been discovered nearby, in which traces of manufacture and extraction of the large blocks used in the construction of the fortress are still visible today (FIG. 10). The masonry of the castle's imposing raised walls appears to have

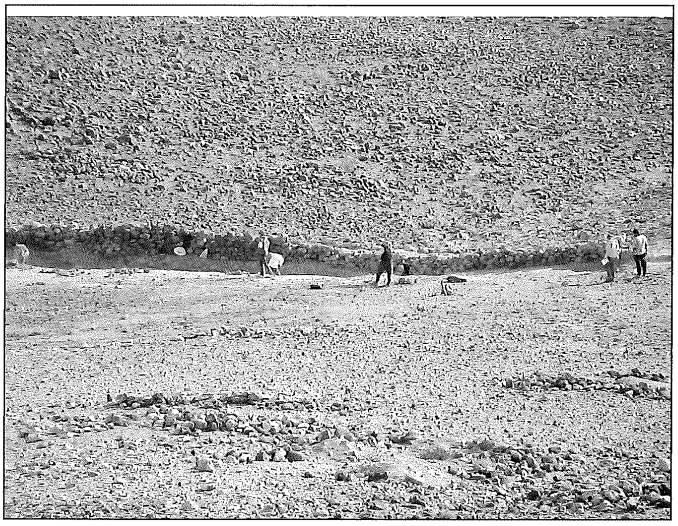
tion at Qaṣr al-Usaykhim Project, is a cooperation between the Department of Antiquities of Jordan and the Istituto Superiore per le tecniche di conservazione dei beni culturali e dell'ambiente "Antonino De Stefano". To date this project has conducted four archaeological campaigns, the initial project took place in 2000.

The archaeological excavations inside and outside of the castle date it to the third century AD, rather than to the Nabatean period, of which there are no traces.

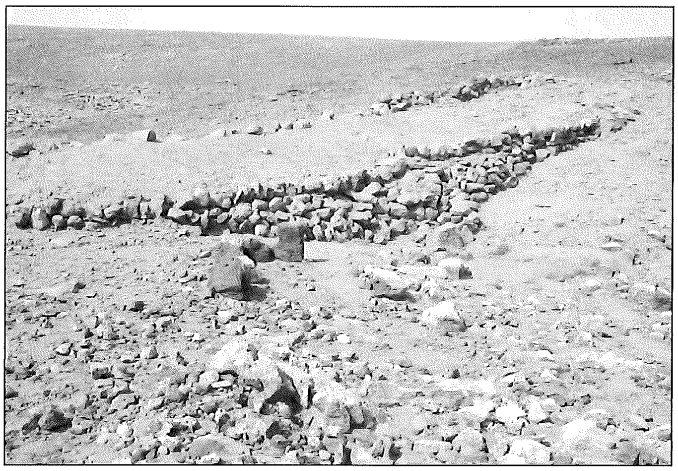
We restored the foundations of the castle that in many places had been exposed by looters. In addition, we effected a test for the restoration of the boundaries of the castle (on the east side). We studied the two boundary walls, which we believe to belong neither to the Roman, nor to a later period, but to an earlier period, owing to both their formation and to their construction technique; which is primitive both in its manufacture and in its placement. On the other hand, within the boundary walls of Qaṣr al-Usaykhim, two stemming were found, which probably sheltered the soldiers' horses in Roman times. On the southern side, a series of small round stemming about (2,00m) have been found made of basaltic rock, possibly obtained from the stone blocks from the external boundary walls of the castle. Then we made a survey in the area around the Castle, and we found urban installation in the vicinity of the Roman castle with 105 residences and two surrounded buildings from the Neolithic period.

We discovered a dam from Neolithic period (FIG. 6) and we restored it (FIGS. 7, 8). Besides, we discovered 36 villages of the urban installation of Jabal al-Usaykhim from Neolithic period (FIG. 9).

We presume that Wādī al-Usaykhim was populated with small villages, which continued to exist through the Byzantine domination. During the *limes arabicus* period, we believe the military gar-

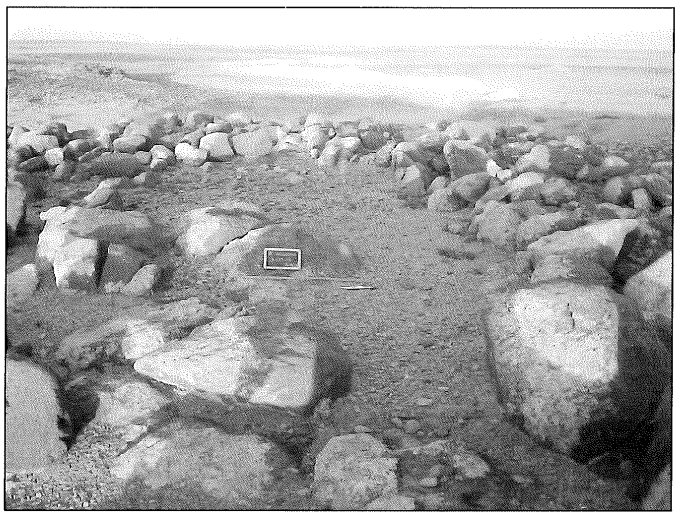


6. The dam from Neolithic period.

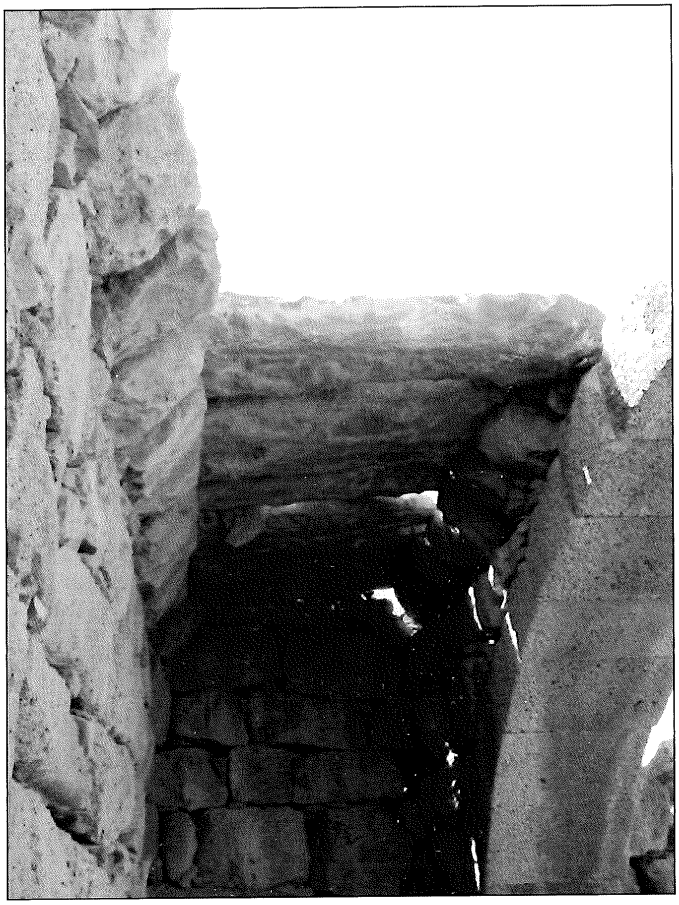


7. The dam after restoration.

8. The dam after restoration.



9. Remains of urban installation.



10. Roofing with a large blocks.

been built with the *pseudo-isodomus* technique, however, further analysis of the structure indicates it was a unique construction technique developed in the border regions of the Roman Empire. This technique has strong architectural characteristics; in Jordan the traditional buildings were built in this way. We have called it *opus pseudo-isodomus in a Roman manner*.

The *Anastilosi* at Qaṣr al-Usaykhim

The original construction work of the castle was carried out by two groups of workers, starting from the centre of each side and meeting at the corners. For this reason the sides are not equal, but are slightly off.

The *opus pseudo-isodomus in a Roman manner* is constituted of the reciprocal contrast between the blocks.

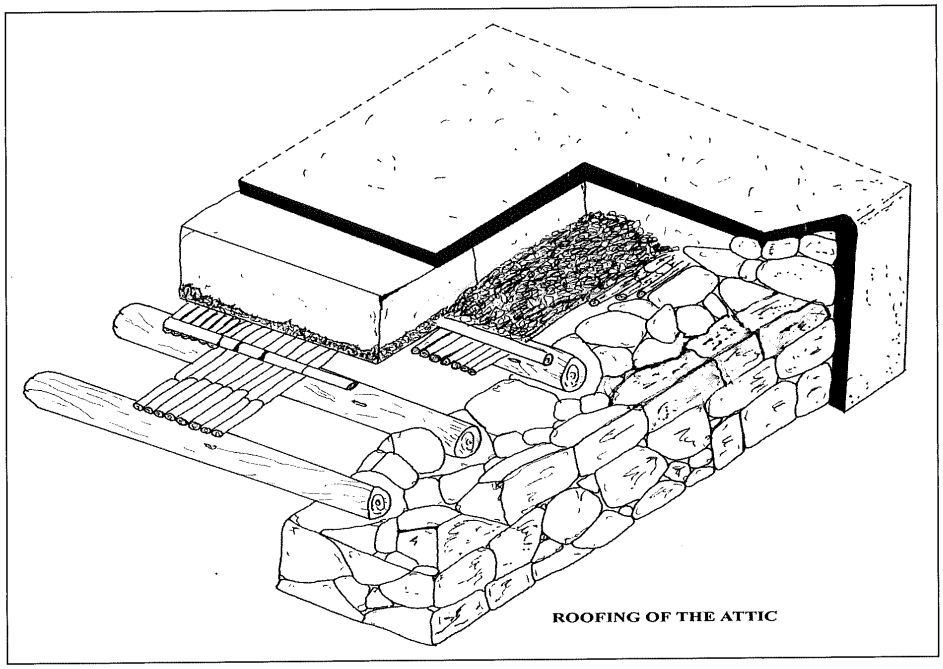
The *anastilosi* will proceed with only two groups of workers, working in opposite directions to reach the corner, as did the original procedure.

The construction techniques used by the Romans at Qaṣr al-Usaykhim are still used in Jordan for the construction of dwellings and Bedouin villages close to the Jordanian desert, which often substitute the typical village tent.

For this reason it would be easy to find skilled labour for a possible reconstruction of the castle, after studying the stratigraphic units of the collapse of Qaṣr al-Usaykhim.

With the ability and experience that some local workers still posses, with the guidance of the Italian restorers they can rebuild the castle, using the *opus pseudo-isodomus in a Roman manner* (FIG. 11).

In order to facilitate this work the reconstruction will use a crane and therefore the reconstruction will be carried out in quite a short time period.



11. The *opus pseudo-isodomus in a Roman manner* (Attic roofing).

Analysing all the archaeological remains of the roman castle of al-Usaykhim we created the *abacus* of all the original architectonic elements of the castle. The *abacus* is the most useful instrument and will allow the realization of the reconstruction intervention of the archaeological conservation (FIG. 12)

In this *anastilosi*, we will not use new materials, but instead we will use the original stones; with the original technique the *opus pseudo-isodomus in a Roman manner.*

Already in this analytic phase, it was possible to establish that all the architectural elements that composed the castle are to be found on site. In order for this important verification to proceed the intervention of the archaeological conservation that we called *anastilosi* is necessary (FIG. 13).

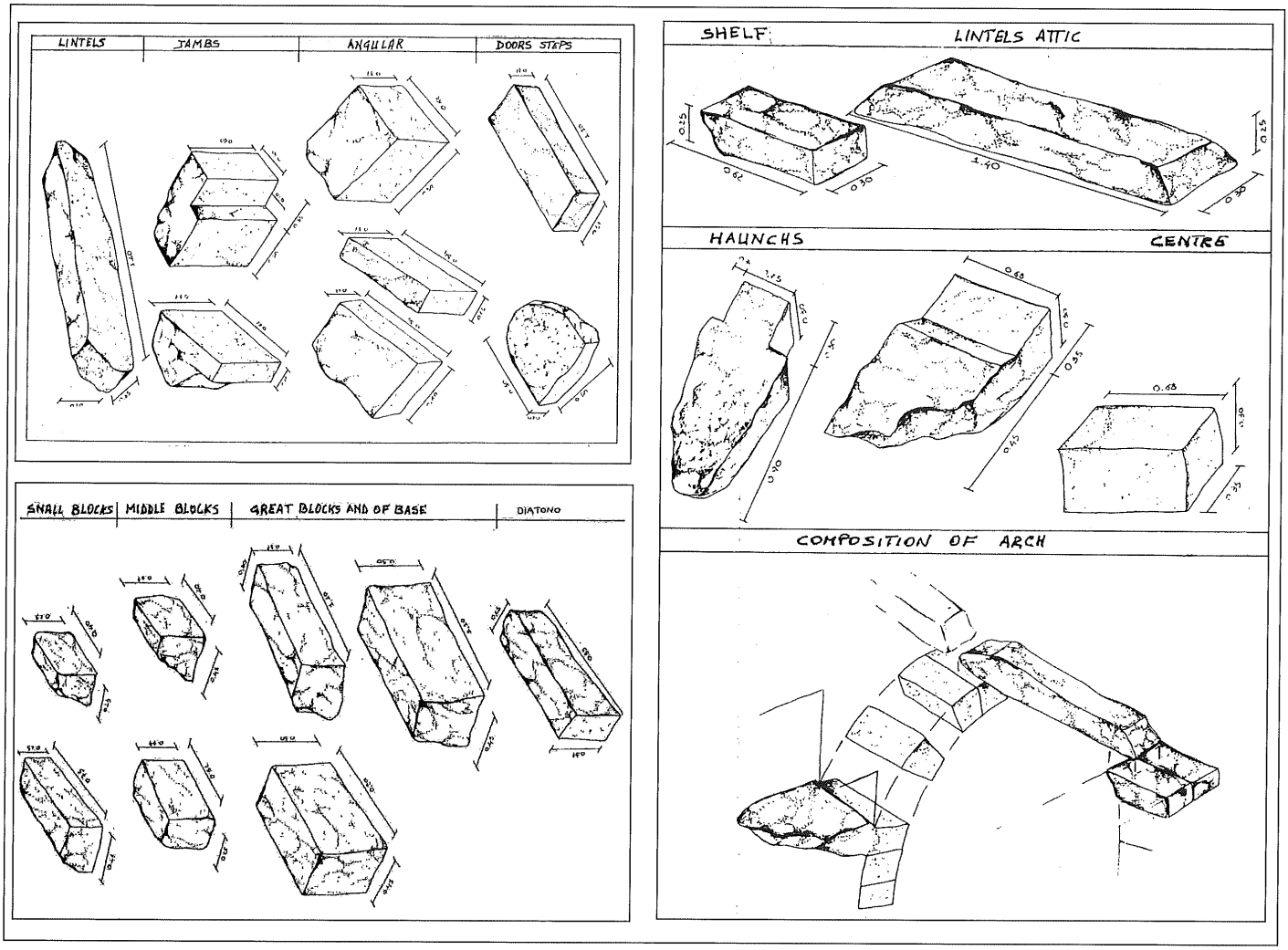
One of the first steps will be to carry out the stratigraphic analysis of the collapses and thus proceed to clear the rooms from the debris, placing the retrieved blocks in an area close to where they will be replaced.

As previously mentioned the work will have to start from the central room then to move towards the corners of each wall facing. This operation will have to be carried out with the use of a crane, numbering the blocks according to the stratigraphy of the collapse.

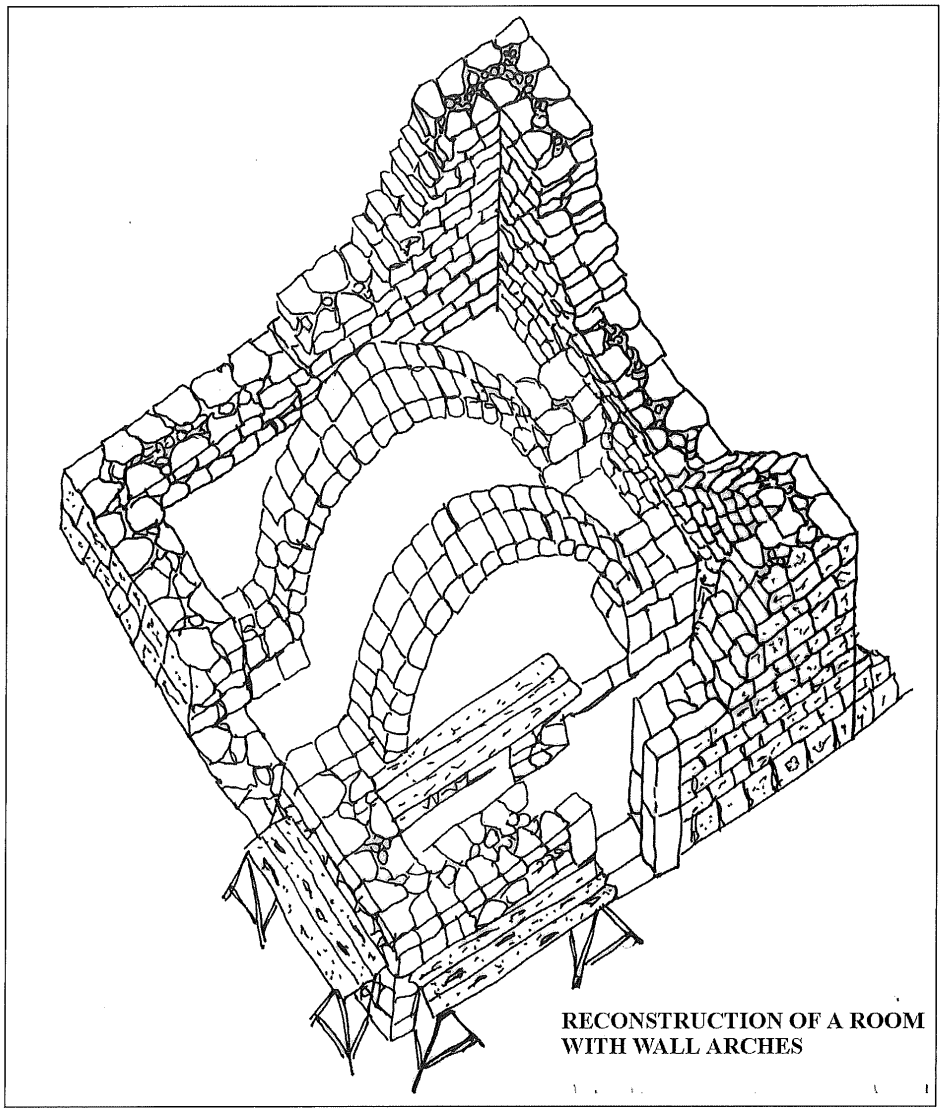
Plan for the Safeguarding of the Area and Integration of the Monument

Connecting the project of restoration of the Roman Castle of al-Usaykhim, a plan to safeguard the territory and the environment of Wādī al-Usaykhim has been prepared to guarantee an essential continuity of intents for the maintenance of the archaeological emergencies and the environment of which the area is rich, so to transform it in *cultural resources.*

The project acquits to the explicit wishes manifested by the local community that intends to preserve the archaeological site Qaṣr al-Usaykhim,



12. Abacus 1, 2 and 3.



13. Reconstruction of arched room.

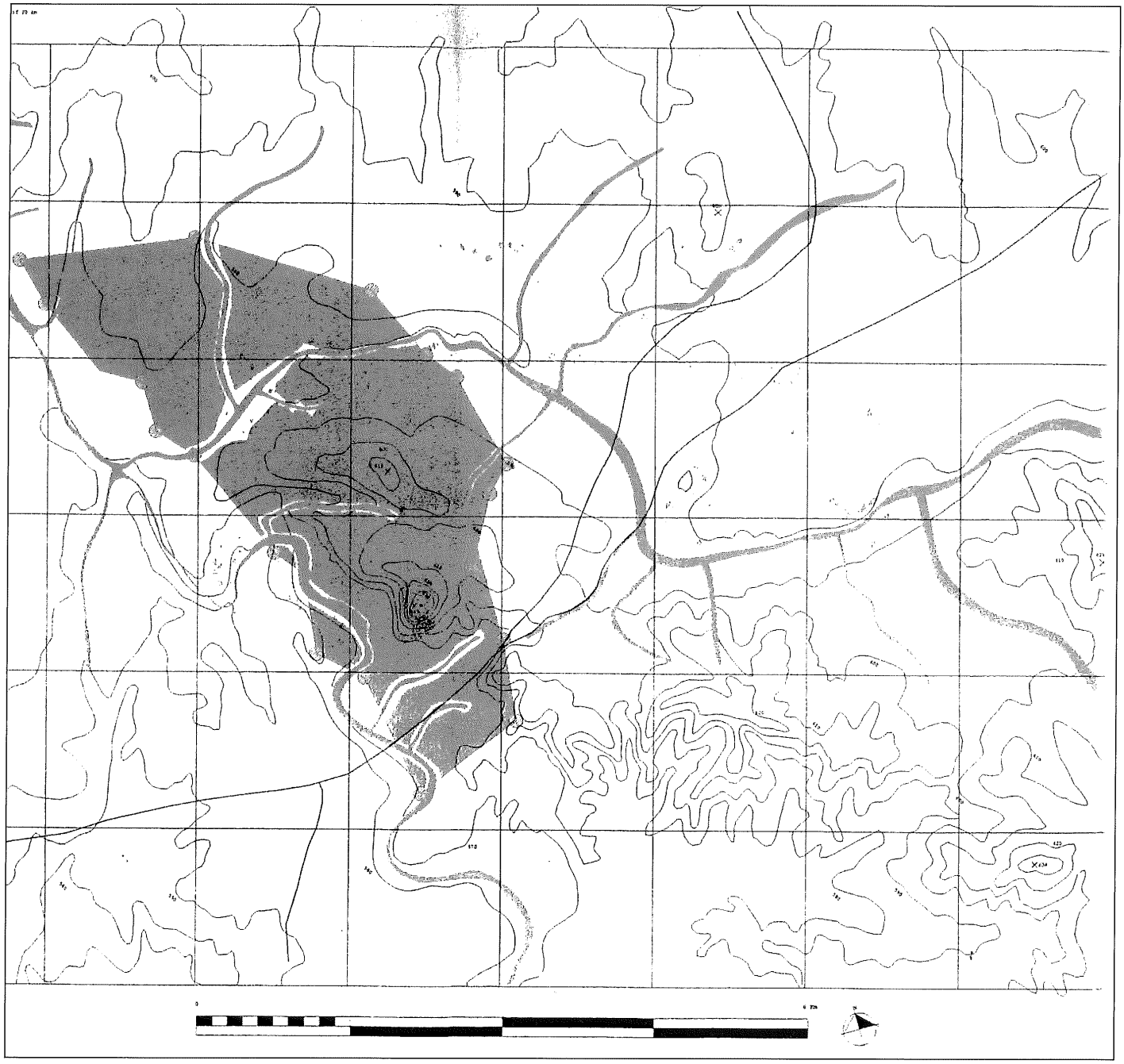
together with the environmental value that it possesses.

From here the double faceted nature of the project is born, that includes the integrated conservation not only of Qaṣr al-Usaykhim, but of the whole testimonies and archaeological remains present in the area (FIG. 14), among which we remember the Bedouin villages, the Roman towers of the *Limes Arabicus*, the thousand of epigraphs of different epochs (FIG. 15) that have been recovered carefully by the team of Prof. Fawwaz al-Khraysheh. Imposing the difficult assignment to restore the best environmental conditions to return a living territory to the native populations.

The scientific orientation of the integrated conservation that will be applied to this territorial and environmental context, is that legacy to the joined action of the techniques of the restoration and the search for the most appropriate functions, for the purpose of rediscovering and exalting, not only the *cultural value* of the archaeological remains, but to underline an indisputable value of use.

The relationship between archaeology and environment is one of total continuity, where the environment is not only a container, but it always constitutes the same motive for the existence of the archaeological heritage.

The principal objective of the project is to give gravitas to the ancient and delicate role, that will be represented by giving life to the resource water and to the fauna: this will be pursued by trying to exploit, to the best of our abilities, the quantities of superficial waters that sporadically stagnate on the bed of the wadi. avoiding that these are inexorable victims of the phenomenon of the evaporation, derived from the joined action of the elevated temperatures, together with the strong winds that insist on this zone, and inserting some special native ar-



14. Project Area.

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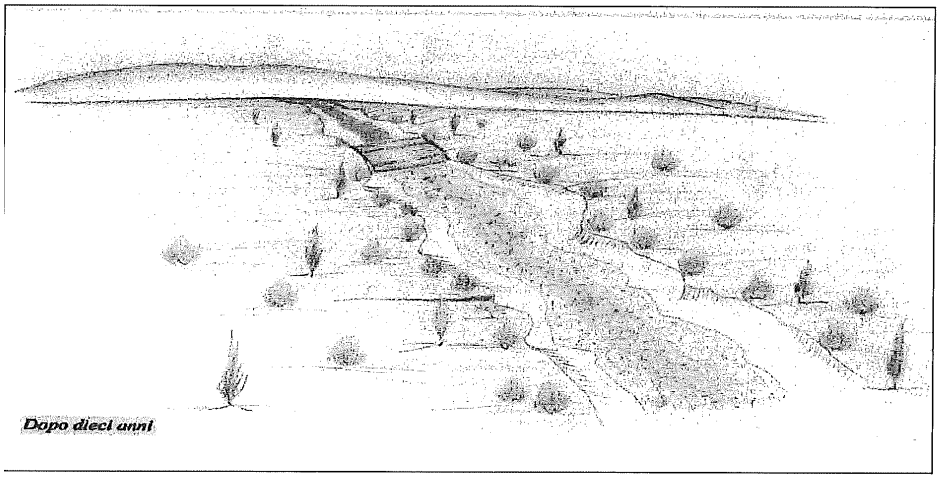
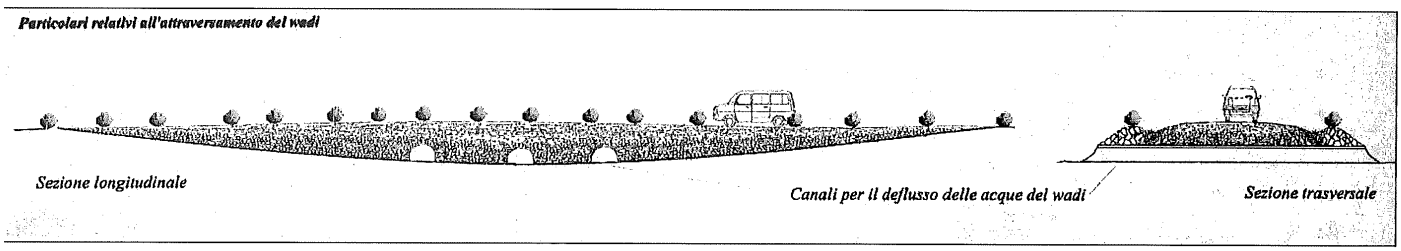
15. Epigraph.

and to the fauna: this will be pursued by trying to exploit, to the best of our abilities, the quantities of superficial waters that sporadically stagnate on the bed of the wadi. avoiding that these are inexorable victims of the phenomenon of the evaporation, derived from the joined action of the elevated temperatures, together with the strong winds that insist on this zone, and inserting some special native arboreal kinds, to perennial character, to the purpose to stimulate the restoration of the environment of the wadi (FIG. 16).

Secondly, the attention of the project will be stretched to the realization of a real archaeological basin (FIG. 17) will have as fulcrum Qaṣr al-



16. Wadi al-Usaykhim ten years later after the reconstruction of the dam.



17. Road of the archaeological basin.

Usaykhim and with the epigraphs, the traps and the archaeological emergencies of the area, with the rest of the Bedouin villages that are found on the banks of the wadi.

The creation of the *archaeological basin* of Qaṣr al-Usaykhim means to redeliver a territory to the contemporary society, which lives in the area.

For a best organization it is correct thought about the archaeological basin as agile tool of management in which everybody feel as protagonist of the actions that is required to him for the development of the area of Wādī al-Usaykhim.

In Italy, now, there are Archaeological basins like Cornus, Leopoli-Cencelle and Castro, and not more archaeological park.

Instead the archaeological basin seen logically as the maximum share and the maximum social involvement, it is the proper tool to manage a project and an intelligent planning that involves the residential population, in the same way as the visitors, or the personnel of guardianship, in the same way of the tourist operators.

Jordan already has a lot of experience in this sphere, with the examples of Petra and Wādī Ramm or with the so-called archaeological park in the historical centre of Madaba. In which an open system exists, where the inhabitants freely cohabit with the archaeological heritage. They know the value of the cultural resources, as do the custodians and the true protectors of it.

In Petra and Wādī Ramm, these processes of integrated conservation of the social and economic value are realized in spontaneously. In fact, the intervention of the Bedouin populations have impose their way to converge the social and economic affairs on the cultural and environmental resources.

With all this in mind we recommend creating for Wādī al-Usaykhim not a protected area but an open system in which the Department of the Antiquities of Jordan is the principal holder, that collaborates with the contemporary society and the population of residents, so that together they manage all the actions for the anticipated safeguarding of that territory and for those cultural resources.

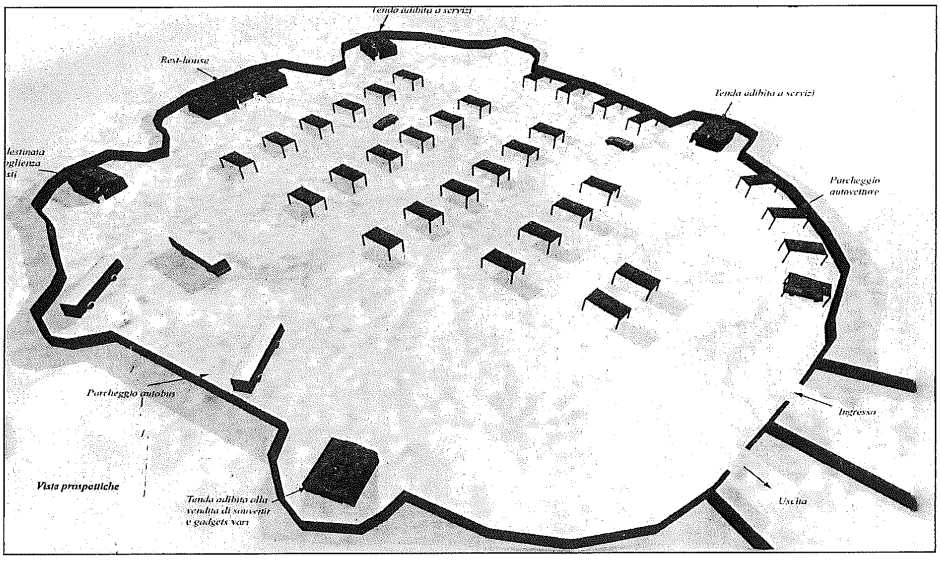
The fruition of the archaeological heritage will involve as a result the necessity to create some special infrastructure for the project, to guarantee the correct management of the archaeological basin. Not forgetting that it will include, besides Qaṣr al-Usaykhim all the other archaeological sites of the area.

Particularly the project foresees the realization of a parking area, where the visitors will leave their own vehicles, motorcars or bus and from which will begin a tour of the area using the Pick-ups of the Bedouin (FIG. 18), that will also act as tourist guides.

The parking area will be developed on a surface of around 459m. square, there will be an area to park the buses and another area designated for motorcars, this last zone will be protected with a series of wooden covers with the same mats used for the Bedouin tent.

This great structure will be inserted in to the environment, and will be realized with traditional constructive and material techniques of the area.

The area of the parking will be built with basalt stones, this solution is inspired by the Bedouin traps



18. Parking Area.

for animals, that are today still present in Wādī al-Usaykhim.

In the service area for the visitors there will be a rest-house tent (FIG. 19), a services tent and another tent for the first reception for the tourists.

Environmental Aspects and Project Hypothesis for the Safeguard of Wādī al-Usaykhim

From the archaeological studies in these regions we have been able to ascertain that the climate has not always been so arid as it is today: this area in fact was populated, even though in irregular way, since the prehistoric times.

We know that in the past the banks of the wadi were rich in vegetation, which is today present in a sporadic way. This guaranteed, in turn the existence of many kinds of animal that were suited to the difficult climatic situation. Besides, there is certainly the presence of different fertile grounds, mainly in the numerous cities of the *limes arabicus* that in the past contributed to making this zone a place of attraction for the nomadic populations.

In the conservation project of the archaeological site of Qaṣr al-Usaykhim we tried to create all the possibilities that would lead to the return of the castle of al-Usaykhim to a place of attraction for the local population.

Water is the principal objective in the project in order to safeguard the whole area.

The program of exploitation of the water resources of Wādī al-Usaykhim is tightly connected to the quantity of water and the economic resources in such an operation. The safeguard plan for the environment of Wādī al-Usaykhim aims to increase the availability of alternative sources of water, among which a priority role is given to the use of the superficial waters, the artificial recharge of the superior water-bearing and stagnation and of maintenance of the water.

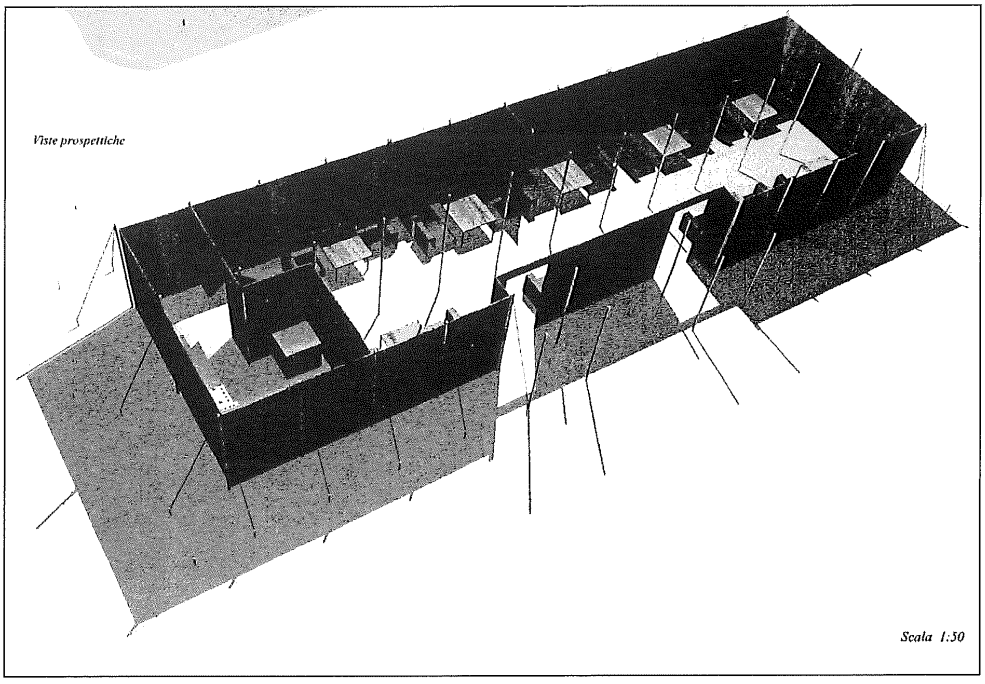
From the history we have learned that the wadi constitutes the motive for the existence of the life in the zone. Instead from the ideological point of view it represents a potential water resource disposition.

Then the principal problem to be avoided is that of the evaporation, with the problem becomes how to best utilise the precious quantities of superficial waters. The excessive exploitation of the available waters in the subsoil has changed the direct needs of the zone.

Our intervention foresees the realization of obstruction in the wadi, located in more points, for limiting the phenomenon of the evaporation to favour the infiltration of the waters in the subsoil. In this way we have created a natural recharge of the superior water-bearing, which will have as the first consequence the reinvigoration of the vegetation.

The recharge of the superior water-bearing, gotten through the obstruction, will allow us to excavate more wells that will constitute the principal water resource.

The wells foreseen by the project will be in low

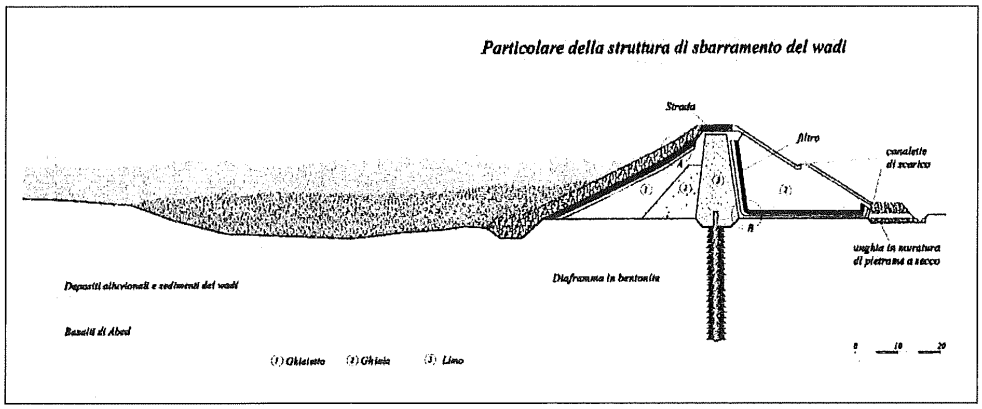


19. Tent of services.

output. There will be three structures of obstruction, constituting small dams, 3m high and around 40m wide, realized with loose materials, with a nucleus of mud and covering in basalt, both are available *in situ*. The choice of this type of structure derives from the necessity to totally integrate them into the environment of the wadi

In order to favour the infiltration of the water, the subsoil of the dam will be endowed with a diaphragm in *Bentonit* (FIG. 20) that will avoid obstructions occurring in the water.

With this intention we have already restored a dame from the Neolithic period to the east of the Roman castle and the Neolithic city. With this restoration we have been able to make green the grounds around the dam, since it holds the water for along time.



20. Section of reconstruction of the wadi.