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Bruno Helly

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The Church of the Transfiguration (Khumarzhm) in Garni: Archaeoseismology and Transformations of this monumental Building from Antiquity to the 19th Century.

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Bruno Helly* and Alain Rideaud**

10 ***UMR 5189 Hisoma (CNRS - Université Lumière - Lyon 2)**

Maison de l'Orient et de la Méditerranée - Jean Pouilloux, 7, rue Raulin 69007 LYON, France

****Architecte DPLG, 4, Champ de Mars, 71700 TOURNUS France**

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Corresponding author : Bruno Helly, e-mail : bruno.helly@mom.fr

Abstract

20 The Church of the Transfiguration (Khumarzhm) in Garni occupies a privileged position in the center of the village of Garni, a few hundred meters from the fortress and the ancient temple that retain the curiosity of tourists. Our observations show that this building presents obvious traces of destruction and reconstruction resulting from a succession of events related to transformations in its destination and to environmental constraints, in particular successive earthquakes likely caused by
25 the Garni fault. The confrontation of these destructive and reconstructive sequences with those that have been recognized on many other monuments of the region helps to precise the seismic history of modern Armenia.

Keywords : Garni, Armenia, Khumarzhm Church, Garni fault, historic seismicity.

30 Introduction

In the frame of the archaeoseismological researches undertaken in Armenia as part of collaborative programs of the CNRS with the Institute of Geological Sciences of the Armenian Academy of Sciences (Helly and Rideaud, 2016), we focused the ancient monuments of the city of Garni. At few kilometers from Erevan (Figure 1), Garni is well known to tourists for the temple built by king
35 Tiridates I in the first century AD in the heart of the old fortress established on a volcanic lava outcrop dominating the gorge of the river Azat. The temple was destroyed by the 1679 earthquake (Guidoboni et al., 2003) and was entirely reconstructed between 1969 and 1976. In fact, the temple and other monuments at Garni, particularly the fortress itself and the churches bear traces of earthquakes that have followed one another over the centuries from antiquity to the present day. It is
40 known today that these seismic events most likely are attributed to an active important fault, referred to as the Garni fault. This fault has been the subject of many studies concerning earthquakes archaeological effects EAE's systematically performed on these monuments for several years with important results (Karakhanyan et al. 2017).

However, the basilica at the Garni village called the Church of the Transfiguration (Khumarzhm)
45 seems to have escaped the attention of specialists. Accordingly, we investigated this monument, because it records a succession of events on the long term. Indeed, the other monuments of Garni do

not offer such a sequence, either because they are not so old, or because they have been restored and transformed. To highlight this situation, we first try to present a synthesis of the elements of chronology of seismic events identified so far. During our 2016 field work in Garni, we had the chance to receive Arkadi Karakanian on the Khumarzham site, that strongly encouraged us to publish our observations and interpretations on this monument. We do it here as a duty of his memory.

1.1. The Astvatatsin Church (XIIth Century AD)

This church is located at the northern limit of the village of Garni (Figure 14). The material observations led us to highlight several constructions and successive states of the present church. It is a single nave vaulted cradle building resting on four quadrangular masonry pillars (Figure 2). The date of construction attributed to this church is the twelfth century by an inscription attached to the south wall of the church. But the current state is clearly the result of a modern restoration, having focused on the facings and openings (visible door and windows to the south), which are much newer and present obvious traces of disorder. Curiously, there is no sign of a door opening in the north wall of this church, as is usually found, to ensure direct communication of the church to the cemetery surrounding the church. The main door, that opens to the west, also seems later, with a porch recently built. The interior floor includes many funerary slabs.

It is also clear that, before this restoration, the upper parts of the side walls, the vault and the cover of the church were rebuilt following a total collapse, from a previous state of which the four pillars still testify: these have indeed a pronounced tilting towards the North-West, that do not reproduce nor the departures of the vault nor the upper parts of the walls. It is likely that only the pillars and probably the lower part of the walls could be attributed to the 12th-13th centuries, while the upper parts would correspond to the reconstruction that followed the 1679 earthquake (Figure 3).

Outside this building, on the side of the cemetery, one meter in front of the north wall of the church, there is a very small element of a construction apparently even older: the interior angle of a lateral wall returning to the south and built on an overflowing foundation still visible and ending on a trimmed face. This probably represents the lateral pillar of a side door opening on the cemetery, as it seems that this was the usual. This door ceased to exist in the following state, presumably because it was considered an element of weakness in the structure of the long north side wall. It should be also noted that in this ancient state, a crack has opened in the internal corner of the wall and that the massive masonry has rotated on a vertical axis. The evidence of a horizontal displacement of the structure could be attributed to an earthquake and possibly to the event of the fourth-fifth century dating reported in the literature (Guidoboni et al., 2003). It should refer to a church somewhat out of the North and probably a little larger in size than the building reconstructed after its destruction (Figure 3a).

Based on these observations, the conclusions that have been published on the history of this monument and which retain only the destruction of 1679, seem to us far too short. We therefore suggest the relative chronology: 1) a first church probably built between the 4th-7th centuries, 2) this church was probably destroyed by an earthquake, 3) a new church was subsequently built slightly offset towards the South, on vaulted nave carried by four square pillars, dated from the 12th-13th centuries, and with a minimum of openings, 4) a destruction event of the upper parts of

90 this (second?) church, likely could be attributed to the 1679 earthquake : at this regard the French
traveler Dubois de Montpéreux noted during his visit to Garni that the dome of St Astvatatsinin and
the cylindrical wall that supported it were in ruins (Dubois de Montpéreux, Voyage around the
Caucasus, Vol III, Paris, 1839), 5) a reconstruction of the higher parts of the church on the pillars of
the previous building has been carried out. It remains uncertain the chronology of some other
elements: the creation of additional openings in the South wall, the construction of the porch and
the modern catering. Some of these transformations could have been made following the 1840
95 earthquake (Figure 3.e).

Not far from the Astvatatsin Church, in the northern part of the village, on the way down to the
bottom of the valley to the river and the famous bridge on the Azat River that gives access to the
Khosrov Preserve, we can find the funerary Chapel Mashtots Harapet, which was built in the
thirteenth century. It has a slightly rectangular plan, with dihedrals hollowed out in the north, east
100 and south walls (Cuneo 1988, Guidoboni et al., 2003. 321). It has been entirely rebuilt in modern
times (joints in resin visible in many points), from the elements remaining on site; only, according
to the available information, the wall of the chevet in the east had remained partly upright. It seems
that the earthquake of 1679 caused the partial ruin of this building like that of the other monuments
of Garni.

105 **1.2. The Bridge of Garni on the Azat River (XIth ou XIIth Century AD) .**

A detailed study of the different states of construction of the bridge over the Azat River is presented
in Helly and Rideaud (2016). It is commonly said that the bridge of Garni was built to allow the
construction of Havouts Tar Monastery and other, established from the 12th Century AD. Our
observations document that there were three successive stages A, B, C in the history of the bridge at
110 Garni (Figure 4). The collapse of the successive bridges of Garni were likely caused by earthquakes,
even if we agree with Karakanian to attribute possibly the destruction of the state B to the 1679
earthquake. It could be supposed that the destruction of the bridge, at first stages A or B, was not
necessarily related to a seismic event of high amplitude: the river caused big erosion, the local fault,
if it existed, played a role, freezing caused the destruction of sections of rock, the left pier collapsed.
115 The validation of one or another of these scenarios, two successive seismic events or simply a local
slope movement over a long time, should be possible. Finally it seems reasonable to reassess the
role of Garni bridge in the chronology of seismic events in the region in consideration of the
chronology of damages or destructions observed on the other monuments in Garni.

1.3. The fortress of Garni and the Katschkar of the Queen Katranid at Garni (870 AD)

120 Observations on the traces of Earthquakes Archeological Effects (EAE's) on the walls of the
fortress of Garni were carried out since 2004 by recognising the displacements of blocks, the
repairing of the upper parts of the wall with joints with the mortar, the resumption of the gate of the
citadel (Karakanian et al., 2017).

Included on the wall stone there are some epigraphs and the one on Tiridate is of particular interest
125 for the aims of the present research. The most appropriate commentary of this inscription was given
by the great Russian epigraphist Yuri Vinogradov in a review known to specialists in Greek
epigraphy, the annual Epigraphic Bulletin of the *Revue des Études Grecques*, published by J. and L.
Robert. In the *Bulletin épigraphique*, 1990, 605. Vinogradov discusses the three previous publications

of the inscription, the first by Mss Kamilla Vasilievna Trever (Trever 1953), the second based on the publication of K. Trever by the Italian epigraphologist Luigi Moretti (Moretti 1956), the third by G. S. Muradjan (Muradjan 1981). Vinogradov observes that the language of the inscription “is pure Greek language of the Roman time, without Armenian words nor indication of liturgy during the construction. The stoneman which engraved the inscription, called Μεννέας (the name was engraved at the same time and not added later as the previous editors thought) was obviously a stonemason (λιθουργός), which came from Asia Minor to perform this work; he had obtained from Tiridate “who wears the crown” (on the Armenian tiara, see G.A Tiracjan, VDI 1982, 2, 90-101, for τειραιφόρος = τιαραφόρος, see Hésychius Lexicon, s. v. τιάρις), for him and his apprentice (μαθητής) Μαρτύριος (name which is not attested only in Christian texts), permission to devote its construction (judging from its dimensions and its preparation, this block served as a beam over a gate of the fortress) to a certain god, perhaps precisely Helios”. In its new reading and interpretation gived by Vinogradov, this inscription becomes an important document for the history of Armenia and the city of Garni. The fortress wall built from basalt blocks linked by anchors date certainly from the 1st century AD and the construction techniques are clearly from Greek tradition, continued by the Roman.

A German scholar, Erich Kettenhoffen (Kettenhoffen 1995) suggested a new date for the inscription: in his opinion the Tiridate of the inscription is not Tiridates I, but Tiridates III, King of Armenia ca. 250-ca. 330, mentioned by Moses of Khorene, 2, 90, and dates the inscription the 298 AD. Kettenhoffen did not considered the analysis of the inscription by Vinogradov and his thesis is not convincing.

For our point of view, the most important observation of Vinogradov is that the basalt block with the inscription was the lintel of the major gate of the fortress, hypothesis presented first by Moretti, which calculated the total length of the block, starting of the calculation of probable number of the letters in the probable restitution of the missing part of the inscription. In our opinion this position is clear, because it is the most visible place for dedicatory inscriptions of buildings or monuments. It is not surprising that in such position the block falled by shock and ground motion caused by an earthquake and was brocken when falling down (Figure 5).

The reuse of this inscribed block as tomb stele (katschkar) of the Queen Katranid at Garni (879 AD) similar to many other basalt wall stones, one of which has an inscription in Armenian dated by the year of 328 of the Armenian era, which corresponds to 879 AD, in the cemetery of the 9th-10th century near the fortress testify that between the 1st and the 10th century AD, the Garni Fortress experienced a strong seismic impact that partially disrupted the northern wall. Karakanian et al. (2017) suggest that the Garni Fortress was severely damaged by the earthquake that occurred late in the 9th century, presumably before 879.

1.4. The temple

The temple of Garni built by king Tiridate was preserved because it was desacrated and reused as a summer palace (tun hovanots) for Khosrovidukht, the sister of King Tiridate III (Moses of Khoren, II, 90-91, traduction Mahé, 244). We do not have anything informations about the state of conservation of the temple between the 4th Century AD and the 1679 earthquake, the later generally considered as responsible of the destruction of the monument. Despite the descriptions of the

170 travelers, there is nothing to tell us in what state of preservation the temple was and whether it had
already suffered some damage before 1679. The lead extraction holes of anchors visible on the
walls of the podium is commonly dated at the 17th century AD. This would be the cause of the ruin
of the temple during the 1679 earthquake. The argument does not seem very convincing. Is there a
175 real increase in vulnerability when removing these horizontal and vertical links? On the other hand,
the presence of inscriptions of the 12th-13th century AD engraved at a certain height on the walls of
the pronaos does not guarantee that the upper parts of the monument were still in place. At the time
of the archaeological excavations that begun in 1949, only the podium of the temple, some bases of
the colonnade and a small part of the north-west corner of the wall of the hall were kept in their
original location. The total reconstruction of the monument carried out between 1969 and 1975
180 deprives us of any useful information to find the succession of the seismic events that could have
produced the Garni fault.

1. 5. St. Sion's Church (659 AD)

North of the temple, encroaching on the vestiges of the palace of the 3th century AD a tetraconque
church dedicated to Saint Sion was built in the 7th Century AD. The historians say the monument
185 was never completed. From the observations that we could make, it seemed to us that this church
had probably been completed to the roof, because in the rubble and deposits of excavations, we find
vestiges speaking: capitals, higher elements of carrying structure, a gargoyle strongly eroded,
remains of masonry vaults, which testify for us that its state of construction was not limited to the
few foundations which remain today and were covered by seats of restoration.

190 These remains of the church, that the archaeologists during excavations carried out to ascend the
temple of Garni, found under the ruined elements of the temple, are strongly eroded, just as the
bases of columns remained in place. This erosion seems much earlier than the 17th century, when
the remains of the church were covered by the ruins of the temple that collapsed during the 1679
earthquake. This significant erosion suggests that the ruins of the church have apparently remained
195 for a long time exposed to the weather and that the monument was affected by a significant
destruction prior to the 17th century.

1.6. Essay of reconstruction on the succession of events before the 1679 earthquake

The succession of the destructions and reconstructions or new constructions that can be attributed to
the activity of the Garni Fault can be summarized as follow:

200 - destructions and reconstructions after the late 4th Century AD: existence of a probable earthquake
between 380-550 AD (Morino et al., 2012, Karakanian et al. 2017).

- destructions and reconstructions in the second half of 9th century AD. Following Karakanian et al.
(2017), the new evidence and re-analysis of the information available earlier indicate that severe
damage of historical buildings and considerable secondary soil deformations in the zone of the
205 Garni Fault occurred around the second half of the 9th century. The authors suggest that the two
destructions suffered by the city of Dvin, - one in 863 and one 30 years later in 893 AD, must be
attributed to the activity of the Garni Fault. In this period, the Garni Fortress was severely damaged
by the earthquake that occurred late in the 9th century, presumably before 879 (Karakanian et al.
2017). The reconstruction of the fortress wall occur in the 10th century AD.

210 The reconstruction of the Saint Grigor the Illuminator Church at Baybuk in the Khosrov Preserve
in the time between 920-1050 AD could have been related with the repair of damages caused by the
Dvin earthquake of 893. The destruction of the Karkop monastery could have happened by an
earthquake between 891 and 900 AD, which is near the time of the second Dvin earthquake in 893.
215 A large cave church and tombs replaces in the 12th and 13th centuries the previous church of the
monastery founded in the in 4th century and located at a distance of 25 km to the northeast of the
Dvin city and 6 km northeast of the active Garni Fault (Karakhanian et al. 2017).

- destructions and reconstructions in 12th-13th Century AD: a destruction of the church Astvatatsin
and reconstruction of a new church can be dated from the 12th-13th centuries. At this time was built
the monastery of Havouts Tar and that of Surp Stefan in the Khosrov Preserve.

220 - destructions and reconstructions caused by the large earthquake of 1679: to this earthquake is
attributed the collapse of the temple of Mithra, the (at least) partial destruction of the Astvatatsin
church, of the Havouts Tar monastery and Surp Stefan monastery.

2. The Church of the Transfiguration (Khumarzhm) in Garni

Unlike the Astvatatsin Church, which is located on the northern edge of the village, and unlike the
225 churches in the Royal Fortress, the ruin of the Khumarzhm Church is located in the center of the
village of Garni (Figure 6). The monument, which is currently in very bad conditions, has been the
object of our observations, a clearance and partial consolidation before 1980, as evidenced by the
resumption of walls including the northeast corner of the building and the accumulations of
architectural pieces piled without care south of the monument. A survey had to be made on this
230 occasion, which led to the publication of a plan in the work of Cuneo (1977 and 1988). This plan
was taken up by J.M. Thierry and P. Donabédian, 1987 (p 529 and fig. 10), with the following
notice:

« Église non datée et mal conservée. Basilique mono-nef à profonde abside semi-circulaire, nef à
voûte renforcée par trois arcs doubleaux appuyés sur des pilastres. La façade sud est bordée par un
235 portique dont l'abside formait avec celle de la nef un chevet rectiligne très épais. De l'extérieur les
façades étaient scandées par des pilastres en faible saillie. La façade est a gardé l'aile droite de l'arc
de la fenêtre ornée de sculptures voisines de celles de K'asal (5^e s.) et de Tekor (fin 5^e s.) Les bases
de pilastres présentent un profil presque vertical à trois registres de listels et de torsades entre deux
gorges, modénature propre au 5^e-6^e s. Le motif rudenté les rapproche de bases d'Echmiadzin et de
240 Tekor. Tout ceci permet de situer approximativement le monument à la fin du 5^e s. Quelques bases
à angles coquillés ajoutées dans le portique attestent une restauration au 13^e s. »

"Church undated and poorly preserved. Mono-nave basilica with a deep semi-circular apse, vaulted
 nave reinforced by three double arches on pilasters. The south facade is bordered by a portico
 whose apse formed with that of the nave a very thick rectilinear bedside. From the outside the
 245 facades were punctuated by pilasters in low projection. The east façade has kept the right area of
 the arch of the window decorated with sculptures close to those of K'asal (5th C) and Tekor (late 5th
 C). The pilaster bases present on an almost vertical profile three registers of listels and torsades
 between two throats, modénature peculiar to the 5th-6th century. The torsade motive brings them
 closer to the bases of Echmiadzin and Tekor. All this allows to date approximately the monument at

250 the end of the 5th Century AD. Some bases with added shell angles in the portico attest a restoration in the 13th century."

Another notice and another map of the building can be found in Mourad Hasratyans' 2000, 99. This plan is the most accurate, but it does not carry any exterior details to the monument.

2.1. The actual state of the monument

255 The monument appears as a mono-nave church with a flat chevet enclosing a semicircular apse, with a gallery contiguous to the south facade, ending in an apse chapel. Our observations on the site aimed to verify the elements of the plan and to advance our archaeological and archaeoseismological study of this construction (Figure 7). We first tried to resume the mapping of the remains. Taking measurements and points for this survey mobilized all the time of our stay on
260 site. To the extent of our means, we realized the photographic coverage of the remains of the building, as well as architectural elements that were piled up in disorder in the south of the building during the clearance and consolidation, very partial, of the remains carried out probably before 1980, by a technician or architect, whose name is not available.

The only remains of the building are the north wall of the main nave (Figures 8 and 9), preserved to
265 the cornice, and the deep semicircular apse inside, flat outside, pierced by a window. The south wall is only preserved over 1- 1,5m in height. just like the west wall where the front door is placed. South of the main nave is a secondary gallery or nave, with a chapel with a round apse to the east, and a door in the west, filled with small stones. Throughout the gallery, on the soil are tombstones in basalt and tufa, some with inscriptions. This gallery or nave is bordered on the south by a series
270 of large pillars built of basalt blocks (Figure 10 A, B, C), opening on to a third nave, also topped on the east by a round apse chapel built with blocks of tufa, to the west by a door. This third gallery or nave is bordered on the south by a wall leveled on the surface of the ground and a stony area by fine pebbles of white limestone, which seems to have been a street.

To the west there are a paved soil of basalt stones, with four bases of columns in basalt, probably
275 reused, which were used to support the arches of an entrance porch or a four-column *gavit* which was added in front of the western facade and the main door. This pavement of basalt blocks extends over the entire width of the west facade. this pavement of basalt blocks stretches along the entire width of the west facade, in front of the main nave door, in front of the blocked gate of the south gallery and in front of a third door further south, to a large mass of basalt blocks assembled with lead-sealed anchors (Figure 10 D). On the north side this soil extends beyond the north wall of the
280 main nave for a length of 6.50 m and seems aligned with a wall parallel to the wall of the basilica, leveled on the surface of the ground. It is notable that around the basilica there are no graves or cemeteries, probably because the presence of streets bordering the building. It seems that the burials were gathered in the cemetery further south, in the cemetery of the 9th-10th century recognized north
285 of the fortress. On the walls and pilasters, we have noted numerous traces of EAEs, rotations, block fractures and hammer shocks (Figure 11).

2.2. The different states of the basilica

The bases of decorated pillars that seem the oldest were carved in basalt, material commonly used in monuments of Roman times. It is decorated with twisted bands (fig. 11), pattern used in late
290 Roman time and paleo-christian time, for example in the mosaic of the baths in the fortress of Garni.

They are in place in construction. In the massif podium built in the apse for the altar there are also two large basalt slabs still visible, the dimensions and weight of which seem to exclude transport and origin outside the building: it seems that they were in place prior to the construction of the podium itself. In addition, at the base of the wall, on the four sides outside, there are three basalt steps of well-worked and polished blocks, which return to the north under this wall, probably marking the end of an older building.

Pillars and bases of columns have been reported or added in an later state. It is cut in a red-orange tuff and decorated with palm-leaf bases at the four corners, typical of the medieval period, in the 12th-13th centuries AD. There is also a different scale in the two types of bases: the basalt bases with torsades are much larger than the bases of tufa, which seems to indicate that the original monument was much more imposing than the church itself (Figure 11). The lintel of the door of the main nave, now in two pieces, is a great basalt block engraved with a line of crosses. It seems that it belonged to the original construction and that the crosses were carved when the building was turned into a church.

In the nave south of the main nave, bases of columns of tufa stone decorated with palmettos were added according to rhythms different from those of the original pilasters in basalt (Figure 12). This decor with palmettes allows to date them from the medieval time.

The study of the wall construction techniques in the north wall of the church shows several phases of destruction-reconstruction marked by changes of stones on the wall and mortars of very different materials : use of volcanic ash, insertion of shells, filling with pebbles, or with trash. The typology of the mortars is characterized as follow : 1) from bottom to top apparatus comprising large rolled river embedded in light gray mortar, 2) gray mortar apparatus with inclusions of small white nodules, 3) equipment with very abundant mortar with inclusions of fragments of pink tuff, 4) a very dark gray mortar with blocks of modest size not including a sitting phase and a phase of recovery of level at the top of the walls (Figure 13).

There are very similar device and mortar changes in the cemetery located to the east of the city not far from Astvatatsin Church, that is to say out of the regular urban pattern which seems to be the oldest city, beyond a wall of about 2 m-thick which could be a limit of this frame and may well have been a wall, just south-east of Astvatatsin Church at the edge of the plateau (Figure 14). In this Garni cemetery, exists ancient tombs and a funerary chapel dating back to the end of the medieval period by the use of red tufa plates and to which a second chapel was subsequently added secondarily.

It appears that the largest of these two funerary chapels was several times ruined and rebuilt. The walls show traces of successive disorders and recoveries materialized by at least three mortars of different textures. The current absence of the vault that obviously collapsed corresponds to the last disorder phase. Engraved inscriptions on the tufa plates of the walls are to be read. The smaller of these two chapels, contiguous to the previous, has almost completely collapsed, except at the angles of the south side pressed against the north wall of the largest. The disorders observed on these two constructions are, with a difference of scale, identical to those observed at Khumarzham: disappearance of the south and south-west side, conservation in elevation of the north wall and the apse. All these features could be likely attributed to an earthquake.

For the Khumarzham Church we can deduce the existence of at least three phases of construction-reconstructions : a medieval one 12th-13th century, probably ruined by the 1679 earthquake, a late antiquity or paleo-christian phase (post 4th century), and probably a older one in the Roman Imperial time for the original building. This original building seems to have three or perhaps five naves. The essential characters of this first building is the use of basalt, the existence of a platform with degrees, the existence of a podium, the existence of a flat apse, the construction techniques with iron anchors coated with lead, the molded pilaster bases with two rows of twists inserted in the walls inside and outside the building.

As in the cathedral in Dvin, for example, the engaged supports of the dome and the angular pilasters built with tufa stones are an addition to an originally single nave, probably with a pair of inner pilasters. The pedestal base retains the traces of an even older building, less elongated to the east and wider to the south. This suggests that it is a basilica dating back to pre-Christian times. Indeed, there is also the low podium, a typical element of pagan architecture, derived from the Greco-Roman tradition, and often used at the base of churches. In the opinion of Hasrat'yan (2000), this building could belong to a temple built in basalt. At the time of the Christianization it was partially destroyed and reused, as other pagan monuments (Parsamyan, 2015). Then the stylobate and the lower part of the building were reused for the construction of the church, whose walls are built of tufa. In our opinion it is most probably a civil basilica rather than a religious building.

The construction of the basilica presents a series of additions: on a rectangular body building with three naves, was added the semi-circular apse, the windows, the portals, the chapel, the portico, finally the south wall of this portico. These additions were made in the 4-5th century, except for the body of the building, which dates from the 4th century at the latest. It would have included a rectangular apse and would, in all likelihood, be a pagan building, which would explain the deviation of 15° in its orientation from the East.

2.3. Garni a town of the late Roman Imperial period ?

The implantation of the church in the urban plan, is in a situation quite different from that of the other religious monuments of Garni, and can only be explained by the recovery of an older monument in a checkered urban pattern, in the center of which there was a slightly elevated space above the general level of occupation (Figure 14). The installation on this more elevated space of a monumental civil building was exploited in the 4-5th century AD for the establishment of the Khumarzham church.

In 2004, at the modern road to Garni near the village of Ghegadir, the existence of an ancient tomb was reported. From this point we have recognized what seems to have been an old road, bordered by a line of stones (old wall) not linked by earth nor mortar. From Geghadir village to Garni this road follows the major incisions and above the landslide zone where the modern road runs. At a short distance from Garni, this old road joins a path still in use for the service of the fields of this area and which goes down a valley in the direction of Garni.

Conclusion

It seems, as often happens, that the researchers and specialists of the ancient monuments of Garni focused on the fortress, the temple and the royal palace, and paid little attention to the other minor monuments. But the observations that can be made about these poor remains bring much more than

375 it seems. Our field observations show that the published plans of the Khumarzham Basilica are clearly insufficient and unusable for an archaeological and archaeoseismological study of construction. This study remains to be done. Our program did not give us the possibility to go beyond observations and we had neither the financial nor the technical means to undertake a search or a complete study of the remains. The present note represents only an account of our observations and interpretations.

380 On the one hand the traces of reconstructions of the walls, the reused elements coming from older phases of the same building make it possible to establish a relative chronology of at least three successive reconstruction events. We should be able to reconcile these different events with those we have recognized on the reconstructions of the fortress of Garni, the destruction of the royal palace or that of the Saint Sion church, the destruction and the reconstruction of the wall itself.

385 On the other hand, these monuments scattered outside the fortress reveal elements of an ancient urban fabric, anterior to the installation of Christian buildings, notably that of Khumarzham Church. However, it seems that no historian or archaeologist has asked the question how could work the royal residence installed in the walls of the fortress of Garni. Nobody wondered about the hundreds of people who accompanied the king during his stays in Garni and out of his stays: servants, garrison troops, courtiers, etc., who came to Garni, most with their families, for the maintenance and service of the royal buildings. It was necessary to house all these people, and it was certainly not in the fortress.

395 Of course, there are apparently no archaeological finds outside of the fortress, but it is clear that no one made observations possibly in the village and if there were some remains at random. One can however think that, even if it was not there, the urban fabric and the basilica should be enough to attest the existence of an ancient establishment out of the royal fortress.

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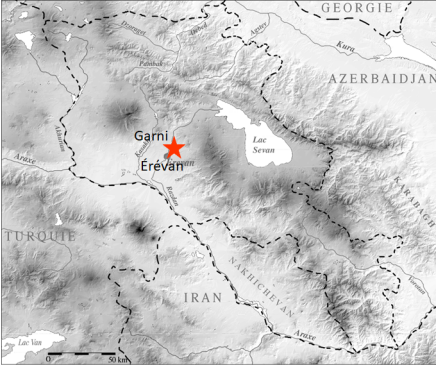
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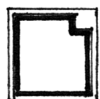
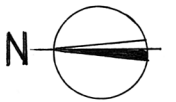
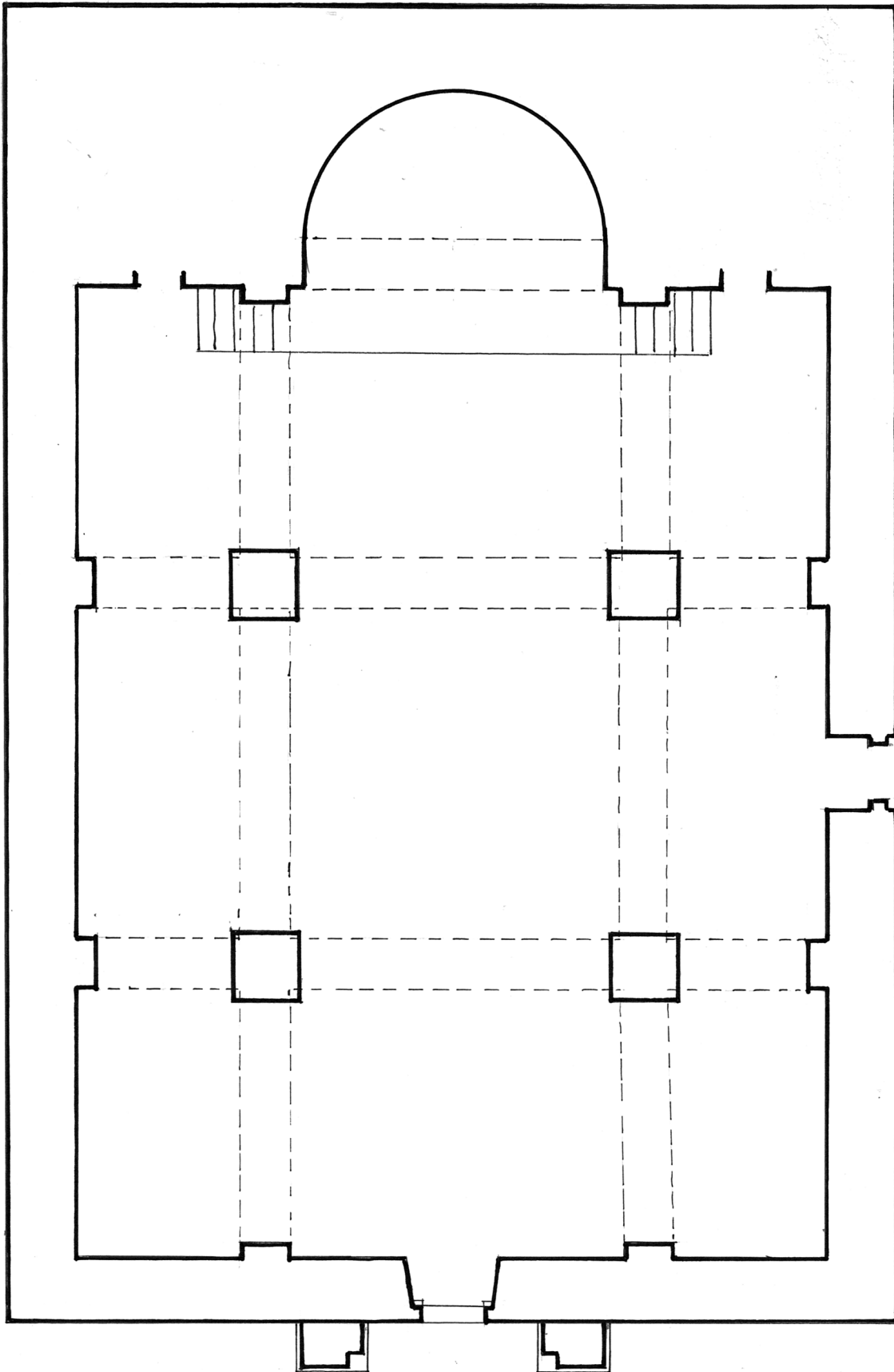
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FIGURE CAPTIONS

Figure 1. Map of Armenia and location of Garni site.

- Figure 2. Map of the Astvatatsin Church. Drawing Alain Rideaud.
- 450 Figure 3. a) and b) : Astvatatsin Church, North of the present church fragment of a door jamb with rotation, rest of an older building. c) and d): tilted pillar in the church and reconstructed vault. e) : the east wall with flat apse. Photos Alain Rideaud.
- Figure 4. The Bridge of Garni on the Azat River. Pictures before the total restauration; Three different phases from the oldest to the most recent : A. Oldest voussoirs at the foot. B. First reconstruction.C. Second reconstruction. Photo Alain Rideaud.
- 455 Figure 5. The reconstructed gate of the fortress of Garni. Photo Alain Rideaud.
- Figure 6. The Khumarzham Church, general view from the south-west. Photo Alain Rideaud.
- Figure 7. Map of the Khumarzham Church at Garni (from Mourad Hasrat‘yan, Early Christian Architecture of Armenia, Moscou, 2000, p. 99).
- Figure 8. The North Wall of the main nave, inner face. Photo Alain Rideaud.
- 460 Figure 9. Sketch of the North Wall, inner face (from Mourad Hasrat‘yan, Early Christian Architecture of Armenia, Moscow, 2000, 99).
- Figure 10.The gallery on the south side and the pillars bordering it to the south (A, B, C); the third door at west with the remains of the massif (D) at the south-west corner of the building, with mortises for anchors. Photo Alain Rideaud.
- 465 Figure 11. Decorated base of pillar in basalt rotated and fractured. Photo Alain Rideaud.
- Figure 12. Decorated base with palmette in the south wall from the outside: decorated base in basalt with twists on three degrees in basalt and a later inserted tufa base with shell decoration at the corners. Photo Alain Rideaud.
- Figure 13.The different wall construction techniques used in the north wall of the church. Photo
470 Alain Rideaud.
- Figure 14. The implantation of the Khumarzham Church in the urban plan of Garni, based on the Google Earth Image, with drawing Alain Rideaud.





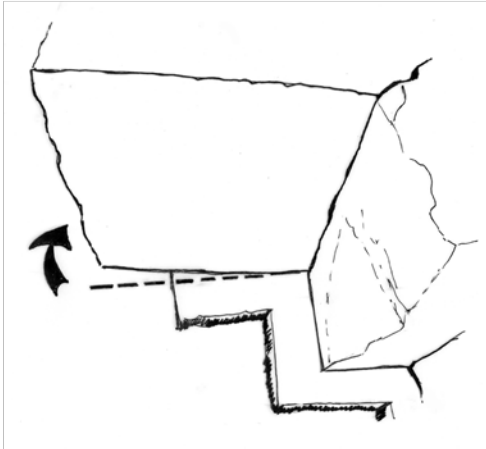
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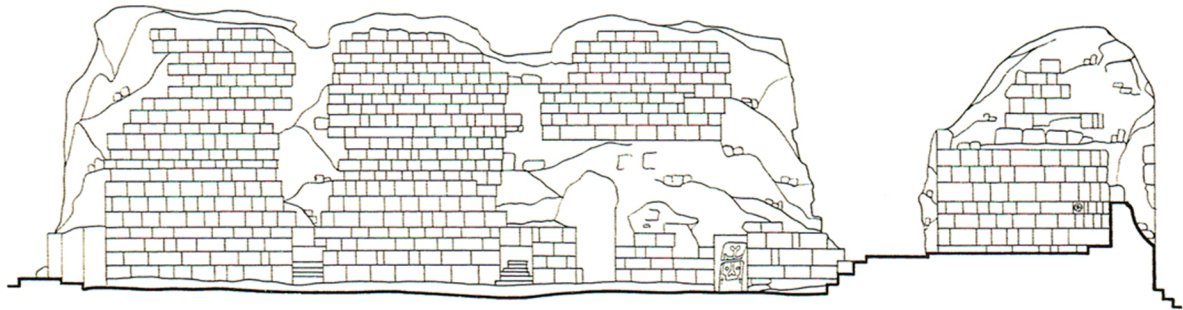










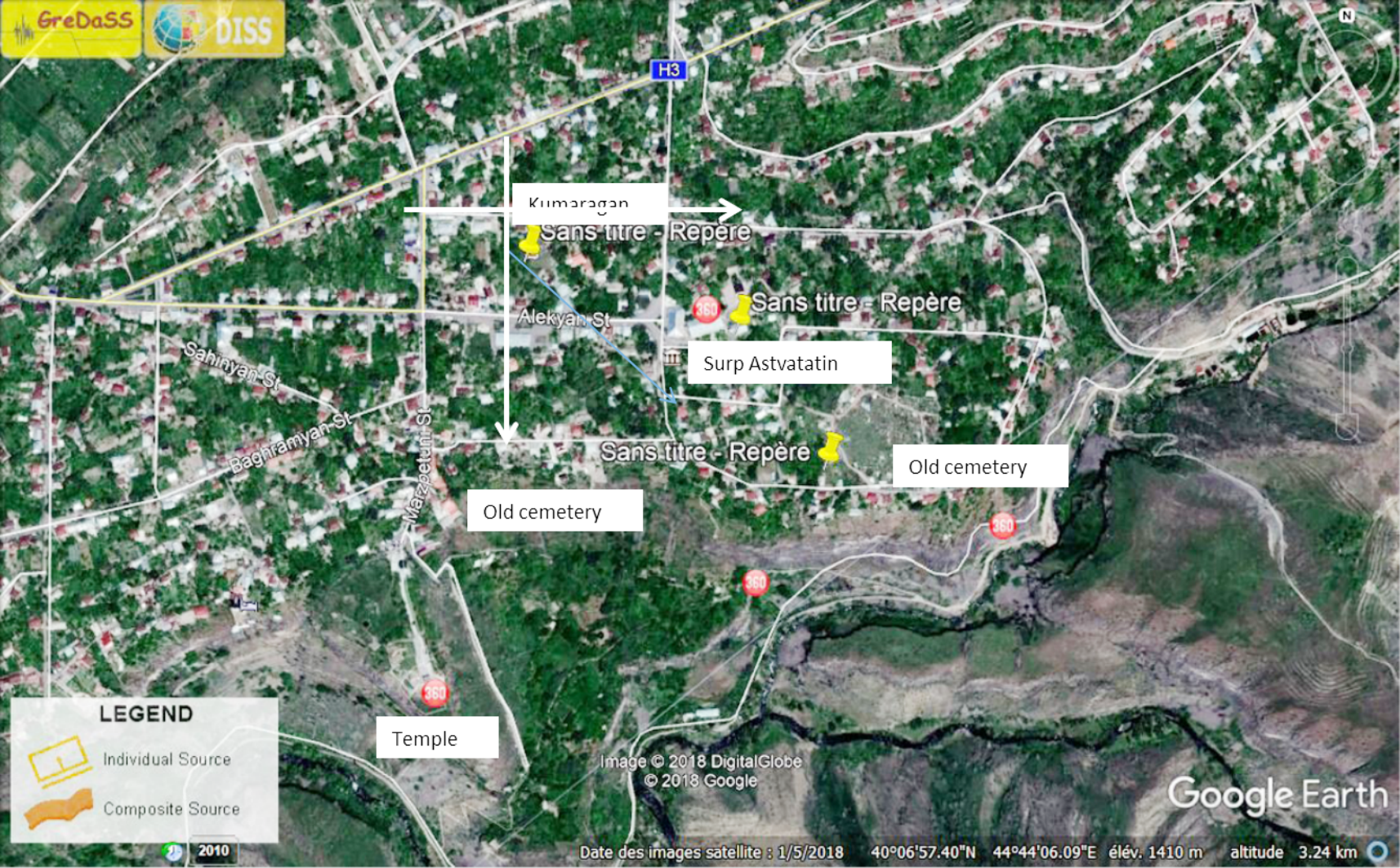












H3

Kumaragan

Sans titre - Repère

Alekyan St

Surp Astvatatin

Sans titre - Repère

Old cemetery

Old cemetery

Temple

LEGEND

- Individual Source
- Composite Source

Image © 2018 DigitalGlobe
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Google Earth

2010

Date des images satellite : 1/5/2018 40°06'57.40"N 44°44'06.09"E élév. 1410 m altitude 3.24 km