

Neolithic of Armenia

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Abstract:

The research studies the archaeological remains dating back to the Neolithic period in the Republic of Armenia; Through a review of the architectural remains, pottery, Lithic industry, burials, faunal and flora remains that were spread in during the end of Mesolithic/Epipaleolithic - early Neolithic in Armenian highlands which were characterized by Lithic industry; and the Agricultural sites that belong to the middle - end of the Neolithic that spread in the Ararat plain and constitutes the Southern part of Shulaveris Shomutepe culture.

Key Words: Armenia, Neolithic, Architecture, Lithic Industry, Pottery, Burials.

Introduction:

South Caucasus includes three republics (Georgia, Azerbaijan, and Armenia). It is bordered on the East by the Caspian Sea, on the West by the Black Sea, on the North by Russia and the Greater Caucasus Mountains, and on the South by Iran and the Lesser Caucasus Mountains. The region is considered a passageway between Asia and Europe (Fig. 1).



Fig. 1: Map of South Caucasus (after Hosh. T, et al, 2014: Fig. 1).

Mesolithic / Epipaleolithic is the first step towards stability, which is followed by the Neolithic or “the Agricultural Revolution” which coupled with changes in various aspects of life as a result of stability. The Neolithic was divided into two phases, the Pre-Pottery phase (in which human achieved all activities of Neolithic except pottery production) and the pottery phase (achieved all Neolithic activities). Many archaeological sites in South Caucasus, in general, lack accurate chronological dating, which added difficulty to determine the exact Neolithic age.

Although, the archaeological excavations in Armenia need more examination and dating, it was possible to identify two types of sites; The first belongs to the early Neolithic that spread in the Armenian highlands, and the second belongs to the agricultural villages in the “Ararat” plain, which is considered the southern part of “Shulaveri - Shomutepe” culture ⁽¹⁾. This period “Neolithic” in Armenia is summarized as follows,

2. Architectural Remains:

2.1. Early Building Attempts:

The first building attempts in Armenia come from early Neolithic sites. A heavily damaged and poor preserved stone construction found in front of the rock shelter “Kuchuk 1” ⁽²⁾ (Fig. 2). Then, burnt clay curved wall (part of round building) 4m length 30-40cm width in square H15 “Lernagog 1” ⁽³⁾ (Fig. 2). Then, the buildings in the agricultural villages of “Masis blur” ⁽⁴⁾ “Aratashen” ⁽⁵⁾ and “Aknashen” ⁽⁶⁾.

¹ - The Neolithic culture in South Caucasus, known also “Aratashen Shulaveri Shomutepe”, the name comes from the first archaeological sites that characteristics of Neolithic identified “Shulaveris Gora” in Georgia, “Shomutepe” in Azerbaijan, and “Aratashen” in Armenia. The culture spread into three groups “around middle Kura river in Kvemo Kartli” Georgia, “Nakhchivan, Mil Plain and Mugan steppe” in Azerbaijan, and “Ararat plain” in Armenia.

² - Early Neolithic site in North Armenia, on North – East of Kuchuk village, discovered and studied in 2004, Petrosyan. A, et al., 2014, P. 139.

³ - Early Neolithic (7th Mill.) open air site in Western Armenia near Lernagog village, discovered in 2013, Arimura, et al., 2018, P. 1, 3.

⁴ - Aceramic Neolithic(6200-5200 b.c) round tell about 1 hec and 2.5m thickness, about 13km south of Yerevan in Ararat plain, discovered by Areshian and Sardaryan in 1969 but their results unpublished, the excavations resumed 2012-2014. The site dated to Pre Pottery due to the full destruction of the pottery layers

Martirosyan - Olshansky, K., 2018, P. 67, 74; Martirosyan. K., et al, 2013, P. 143; Hayrapetyan. A., et al, 2014, P. 178; Martirosyan-Olshansky. K., 2015 b, P. 5.

⁵ - Late Neolithic (5905/5711 – 5663/5481 b.c) round tell 60×90 m about 25 km to the West of Yerevan in Ararat plain, discovered by Sardaryan in 70th of the 20th century, then Aslanyan started work in 1988 – 1990, then Badalyan and Lombard in 1999-2004. The site divided in 2005 into three horizons (0, 1, 2).

Vartoutsikos. B. N. O., 2015, P. 197, 198, 202; Badalyan. R, et.al, 2007, P. 37; Badalyan. R, et al., 2004, P. 400; Martirosyan-Olshansky, K., 2018, P. 64; Smith. A. T, et al., 2009, P. 22; Chabot. A and Pelegrin. J, 2013, P. 182.

⁶ - Late Neolithic tell 100m in diameter, about 25km from Yerevan in Ararat plain, contains 7 horizons, from horizon 2 to 7 belong to Neolithic.



Fig. 2: Stone Construction, Kuchuk 1
(after Petrosyan. A, et al, 2014. Fig. 7.1)

2.2. Building plans:

Most buildings in Armenia are circular dwellings “the easiest building layout”. It appeared for the first time as the curved walls at “Lernagog 1” and then in the agricultural villages in the Ararat Plain at “Masis blur” ⁽⁷⁾ (Fig. 4), “Aratashen” ⁽⁸⁾ (Fig. 5), and “Akhnashen” ⁽⁹⁾ (Fig. 6). In addition to the rectangular layout of buildings which appeared in the completely destroyed upper layer of “Masis blur” dating back to Pottery Neolithic some walls reached to 4m high (Fig. 3), the rectangular plan considered a new architectural feature in South Caucasus as a whole, not only in Armenia ⁽¹⁰⁾. However, it’s noteworthy that rectangular plan appears in the earliest levels in “Aknashen” (aceramic in horizon VII) ⁽¹¹⁾ although the circular plan is earlier than the rectangular.

Two unfamiliar plan buildings of U shape have existed in Level 1 “Aratashen” long and straight walls, with 9.50m – more than 11.00m length, 1.8m - 2.00m respectively, the preserved height 0.25m, and surrounded by a fence. It is suggested that these two buildings are for agricultural activities ⁽¹²⁾.

Arimura. M, et al, 2010, p. 80; Badalyan. R. S, et al, 2010, P. 187; Chabot. J., 2017, P. 2; Badalyan. R and Harutyunyan. A, 2014, P. 162.

⁷ - Martirosyan-Olshansky. K, et al., 2013, PP. 145- 146; Martirosyan-Olshansky. K., 2015 b, P.10; Martirosyan-Olshansky, K., 2018, PP. 74-75.

⁸ - Badalyan. R, et al., 2007, P. 41; Badalyan. R, et al., 2004, P. 403; Vartoutsikos. B. N. O., 2015, PP. 198-199.

⁹ - Badalyan. R. S, et al., 2010, PP. 188-189; Vila. E, et al., 2017, P. 100.

¹⁰ - Hayrapetyan. A, et al., 2014, PP. 178-180.

¹¹ - Perello. B., 2017, P. 5; Chabot. J., 2017, P. 2; Aknashen-Khatunarkh, P. 5.

¹² - Vartoutsikos. B. N. O., 2015, P. 198; Badalyan. R, et al., 2007, PP. 40-41; Badalyan. R, et al., 2004, PP. 402-403.



Fig. 3: Rectangular building “Masis blur”
(after Martirosyan-Olshansky. K, 2015 b, P. 5.)



Fig. 4: Building S004 “Masis blur”
(after Hayrapetyan. A, et al, 2014, Fig. 8)



Fig. 5: Architectural remains – Aratashen,
(after Hovsepyan. R & Willcox. G, 2008, Fig. 2.)



Fig. 6: round building –horizon V Aknashen.
(after Perello. B, 2017, Fig. 4.)

2.3. Building Material:

The main raw material is clay blocks and slabs in “Lernagog”⁽¹³⁾, “Masis blur”⁽¹⁴⁾, “Aknashen”⁽¹⁵⁾; mudbrick (thick and coarse) were integrated with clay at horizon II “Aratashen”⁽¹⁶⁾; and the full building of mudbrick wall was in horizon I “Aratashen” (three perpendicular oblong mudbrick walls about 45×25×8cm)⁽¹⁷⁾; stone used only in “Kuchuk I”⁽¹⁸⁾.

The walls thickness varying between 26-28cm in Level I “Masis blur”⁽¹⁹⁾, 35 - 40cm and 25-30cm in horizon V, and 25-50cm horizon IV “Aknashen”⁽²⁰⁾.

2.4. Walls and floors plaster:

Some buildings had a layer of plaster on walls, floors, or both. A plastered mud floor “hardened from firing” was found in “Lernagog 1”⁽²¹⁾. The floors were plastered in

¹³ - Arimura, et al, 2018, P. 4.

¹⁴ - Hayrapetyan. A, et al., 2014, PP. 178- 181.

¹⁵ - Badalyan. R. S, et al., 2010, P. 189.

¹⁶ - Badalyan. R. S, et al., 2010, 189; Vila. E, et al., 2017, P. 100.

¹⁷ - Vartoutsikos. B. N., 2015, P. 198; Badalyan. R, et al., 2007, PP. 40-41; Badalyan. R, et al., 2004, PP. 402-403.

¹⁸ - Petrosyan. A, et al., 2014, PP. 139- 140.

¹⁹ - Hayrapetyan. A, et al., 2014, PP. 178- 180.

²⁰ - Badalyan. R. S, et al., 2010, PP. 188-189.

²¹ - Arimura, et al, 2018, P. 4.

upper level and buildings (S006, S004) lower level in “Masis blur”, level I “Aratashen”, and horizon IV “Aknashen”, and the walls were plastered in (S006, S004) buildings “Masis blur”, the U shape building “Aratashen”⁽²²⁾.

2.5. Subsidiary Buildings:

From outside: fire places its diameter varying between 30-40cm and walls thickness 26-28cm, storages have wall thickness 10-12cm “horizon I Masis blur”. In “level I Atatashen” found pits contain pebbles and two storages built of mudbrick. In “horizon V Aknashen” an outside yard contain storages and food preparation places has been found⁽²³⁾.

From inside: varying between hearths in the middle of S017, S018 buildings “Masis blur”, small hearths in “Aratashen”, hearth ruin its diameter 50×120 cm “sub phase IV horizon V Aknashen”. Small round structures (grain and tools storing) in “Aratashen” and “Aknashen”⁽²⁴⁾.

2.6. The buildings function:

Some buildings have special function purposes; not as dwellings. The round building “S004 Masis blur” suggested to be as a workshop, its diameter 2, 70 – 2, 90 m, walls and floors coated with clay, the building contains amount of large pebble, obsidian cores, shaft straightener, amount of obsidian and bone tools, stone axe, and the most important object serpentine oblong seal⁽²⁵⁾ 5,5cm length (Fig. 4), it is suggested that this building abandoned because of fire broke out⁽²⁶⁾. Two U shape buildings in “Level IIb Aratashen” surrounded by fence and contained dung and charcoal grains, these buildings suggested to be for crop threshing, for circulation, or as social activities courtyard⁽²⁷⁾.

2.7. Special architectural features:

Some buildings had a special features; some wall buildings in “Masis blur” covered with clay slabs (3cm thick) on both sides; which fulfills enhance thermal stability and prevent water leakage into the buildings⁽²⁸⁾. Some aesthetic were used in “building S001 Masis blur” oblong clay blocks in two colors put alternatively, in

²² - Hayrapetyan. A, et al., 2014, PP. 180-181; Vartoutsikos. B. N., 2015, P. 198; Badalyan. R, et al, 2007, PP. 40-41; Badalyan. R, et al., 2004, PP. 402-403; Badalyan. R. S, et al., 2010, P. 188.

²³ - Hayrapetyan. A, et al., 2014, PP. 178 – 180; Badalyan. R, et al., 2004, P. 403; Badalyan. R. S, et al., 2010, P. 189.

²⁴ - Badalyan. R, et al., 2007, P. 41; Badalyan. R. S, et al., 2010, P. 189; Hayrapetyan. A, et al., 2014, PP. 178 – 181; Badalyan. R, et al., 2004, P. 403.

²⁵ - It is known that seals were used as a mean to facilitate buying and selling transactions, and were an identity for its owner, the horizontal lines may indicate to numbers and symbols. (الشيايب وأبو غنيمية، 2012، ص 178-155).

²⁶ - Hayrapetyan. A, et al., 2014, PP. 180-181.

²⁷ - Vartoutsikos. B. N., 2015, P. 198; Badalyan. R, et al., 2007, PP. 40-41; Badalyan. R, et al., 2004, PP. 402-403.

²⁸ - Hayrapetyan. A, et al., 2014, PP. 178- 180.

“level II Aratashen” buildings clay bands in different colors put vertically and horizontally ⁽²⁹⁾. Two semicircular buttresses (65×55cm, 125×65cm) were found on the façade (on sides of the entrance) circular building in “horizon IV Aknashen” ⁽³⁰⁾.

3. Burials:

Generally, there were few burials in South Caucasus during Neolithic, of course its small number doesn't indicate the residents' number. People may buried their dead outside the settlements and only the important people have been buried inside it, or they buried inside the settlements in places don't uncovered yet, or it destroyed in later periods.

Burials are found in two sites only in Armenia “Masis blur” and “Aknashen”. In “Masis blur” an adult female burial found, in a flexed position laying on the left side and the arms are next to the body, an obsidian blade buried with the body, the skull covered with red ochre and under the skull fragments of Azurite, around the neck a necklace “of beads”, and inside the mouth a piece of red ochre. Another burial of an adult male with a separated head has been found in a flexed position on the right side, many pottery sherds and obsidian blades have been found, and the rib bones cover with the red ochre ⁽³¹⁾. A third burial of an adult male about 30-40 years



old, the body extended on the back (Fig. 7), the bones are in a bad condition. Obsidian blades placed around the body, above the head and the left femur and inside a hand grip. There are two pits full of deposits in this grave, the first full of bone tools, obsidian tools, a pendant and stones. The second pit full of stone flakes, a bone awl, grinder, in addition to a scattered bones associated with animal bones suggested to be related to a destroyed burial ⁽³²⁾.

Fig. 7: male burial – Masis blur, after Martirosyan-Olshansky. K., 2018, Fig. 4-18b.

²⁹ - Badalyan. R, et al., 2004, P. 406; Badalyan. R, et al., 2007, P. 41; Hayrapetyan. A, et al., 2014, PP. 178- 180.

³⁰ - Badalyan. R. S, et al., 2010, P. 188.

³¹ - Martirosyan-Olshansky. K., 2015 b, P.7; Martirosyan-Olshansky. K., et al, 2013, P. 145; Martirosyan-Olshansky, K., 2018, PP. 70-71.

³² - Martirosyan-Olshansky. K., 2018, P. 88.

In “Aknashen” four burials were found, the first for a child 5-7 years old placed on its left side (Fig. 8) with a fractured skull and the upper limbs couldn't be determined “the right arm could distinguish”, metal ring (copper or bronze), two obsidian pieces, few pottery sherds, and fragments of animal bones were found with the burial ⁽³³⁾. A group (pile) of bones (left humerus, upper quarter of the left ulna, leg and femur bones, two complete left ribs, some right ribs) of fetal about 38 week were identified. A skull of an adult 20-39 years old (Fig. 9) was found. The skull was placed on the left side, missing the lower jaw and possibly the left jaw bone as well, and showed signs of cranial sutures. The skull associated with animal bones, bone tools, obsidian, and pebbles ⁽³⁴⁾. It is likely that this skull as deposit or belong to a disturbed burial (the most probable due to the find of some bone at the same age). The skull indicates an old fracture caused by sharp tool and the bones were reshaped again ⁽³⁵⁾. The last burial is the lower part of an adult (the age and gender couldn't be determined) possibly the missing of the upper part due to disturbance of the burial, the burial is without any deposits ⁽³⁶⁾.



Fig. 8: child burial, horizon IV Aknashen, after, Badalyan. R, et al., 2010, Fig. 6.



Fig. 9: Cranial from Aknashen, after, Poulmarc'h. M., 2014, Figs. 204-205.

4. Lithic Industry:

4.1. Tools forms:

The early Neolithic tools found in Armenia are similar and indicate hunting activities, which differ from those found in agricultural villages that indicate agricultural activities. The stone tools found at “Gigarot” ⁽³⁷⁾, “Kuchuk 1” (Figs. 10,

³³ - Badalyan. R, et al., 2010, PP. 190-191.

³⁴ - Poulmarc'h. M and Le Mort. F., 2015, P. 4; Poulmarc'h. M., 2014, PP. 112 – 116, 289.

³⁵ - Poulmarc'h. M., 2014, PP. 114 - 115, 291.

³⁶ - Poulmarc'h. M and Le Mort. F., 2015, P. 4; Poulmarc'h. M., 2014, PP. 116, 117, 118.

³⁷ - An open air site located to the East of Gigarot village on the Southern slope of Pambak range. It is discovered in 2002 by Armenian – French expedition during survey in Ksakh valley, dated back to Early Holocene.

11) are similar to the tools found at “Kmlö 2 cave”⁽³⁸⁾ which named “Kmlö tools” after the site, in addition to geometric microlithic tools that were "arrow blades, scalene bladelets, backed bladelets, end scrapes, chisel, serpentine shaft straightener and microburins⁽³⁹⁾. In “Lernagög 1”, microlithic tools (backed bladelets, lunates, trapezoids) and regular blades with regular lateral edges⁽⁴⁰⁾ are found. In “Tsaghkunk”, notched tools, end scrapers, burins and chisels are found⁽⁴¹⁾.

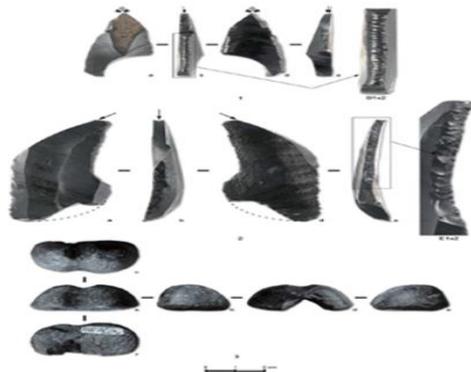


Fig. 10: lithic tools from Gigarot, after. Petrosyan. A, et al., 2014, Fig. 12.



Fig. 11: Lithic tools from Kuchuk 1, after, Petrosyan. A, et al., 2014, Fig. 8.



Fig. 12: Obsidian blades and flakes, Masis blur after, Martirosyan-Olshansky. K., 2018, Fig. 4-12.

The lithic tools are similar in the three agricultural villages (Fig. 12), included retouched blades, chisels, sickle blades, side and end scrapers, big circular scrapers, shaft straighteners, burins, punch, axes, notched tools, in addition to few microlithic found in “Masis blur and Aknashen”⁽⁴²⁾.

- Petrosyan. A, et al., 2014, PP. 141-142.

³⁸ - Known also as “Apnaghyogh 8”, it’s a cave located on the Eastern side of Aragats Mountain in the middle stream of Kasakh river, West Armenia, discovered in 2002, excavations started in 2003- 2009 by Gasparyan and Chataigner, dated to the transition period from Mesolithic to Neolithic. The site characterized by what known as “Kmlö tools” (blades or flakes characterized by continuous and parallel retouch on one or both lateral edges, the retouch stops before the end of the upper part which takes hooked form. Kmlö tools are typical to “Lekala tools” in “Paravani” East Georgia and “Çayönü tools” West Asia “East Turkey”).

- Petrosyan. A, et al., 2014, P. 136, 138; Arimura. K, et al., 2009, PP. 17-18; Varoutsikos. B. N., 2015, P. 174; Chataigner. C, et al., 2015, P. 4; Gasparyan. B and Petrosyan. A., 2015, P. 23; Chataigner. C, et al., 2012, P. 40.

³⁹ - Petrosyan. A, et al., 2014, P. 139, 142; Varoutsikos. B. N., 2015, P. 176; Chataigner. C, et al., 2012, P. 40; Arimura. K, et al., 2009, P. 18.

⁴⁰ - Arimura, et al, 2018, P. 5.

⁴¹ - Petrosyan. A, et al., 2018, P. 36.

⁴² - Martirosyan-Olshansky. K., et al., 2013, P. 146; Martirosyan-Olshansky. K., 2015 b, P.14; Varoutsikos. B. N.,

4.2. Industry technique:

Different techniques have been used in Neolithic sites, pressure technique has been used in “Gigarot”⁽⁴³⁾ and “Tsagkhunk”⁽⁴⁴⁾, pressure technique and direct percussion in “Kmlor” and “Lernagog”⁽⁴⁵⁾. Three techniques (indirect percussion, pressure with crutch and pressure with lever) were used in the agricultural villages “Masis blur”⁽⁴⁶⁾, “Aratashen”⁽⁴⁷⁾ and “Aknashen”⁽⁴⁸⁾.

4.3. Tools Uses:

The purposes of tools varied in all sites, in early sites: for mining “Gigarot”⁽⁴⁹⁾, for hunting “Kmlor”⁽⁵⁰⁾ due to the abundance of microlithic tools, or for agriculture as harvesting sickles (inserted into a handle) or for crop threshing “Aratashen and Aknashen”⁽⁵¹⁾.

4.4. Raw Material and the sources:

The lithic industry in Armenia depends on obsidian which obtained from many sources, and the most important were Arteni, Hatis, Gegasar, Gutansar, Kars, Sarıkmış, Mydan dağ, and Tsagkhnyats⁽⁵²⁾. In addition to other stone in small proportions like: flint, bazelt, dacite and quartzite in “Gegarot, Kmlor”⁽⁵³⁾, gray – light gray – brown flint “Tsaghkunk”⁽⁵⁴⁾. In agricultural villages “Masis blur, Aratashen, Aknashen”, andicite, bazelt, dacite, flint, serpentine, quartz, lime stone, jasper⁽⁵⁵⁾.

2015, P. 139; Martirosyan-Olshansky. K., 2015 a; Martirosyan-Olshansky, K., 2018, PP. 78-79; Badalyan. R, and Harutyunyan. A., 2014, P. 164; Badalyan. R. S, et al, 2010, P. 196; Badalyan. R, et al., 2007, P. 44.

⁴³ - Petrosyan. A, et al., 2014, P. 142.

⁴⁴ - Petrosyan. A, et al., 2018, P. 39.

⁴⁵ - Petrosyan. A, et al., 2014, P. 138; Arimura. K, et al., 2009, P. 18; Chataigner. C, et al., 2012, P. 41; Arimura, et al, 2018, P. 5.

⁴⁶ - Martirosyan-Olshansky. K, et al., 2013, P. 146; Martirosyan-Olshansky. K., 2015 b, P.14; Varoutsikos. B. N., 2015, P. 139; Martirosyan-Olshansky. K., 2015 a; Martirosyan-Olshansky, K., 2018, PP. 78-79; Badalyan. R, and Harutyunyan. A., 2014, P. 164.

⁴⁷ - Chabot. A and Pelegrin. J, 2013, P. 184; Badalyan. R, et al., 2007, PP. 44-46.

⁴⁸ - Chabot. J., 2017, P. 3.

⁴⁹ - Petrosyan. A, et al., 2014, P. 142.

⁵⁰ - Petrosyan. A, et al., 2014, P. 139; Varoutsikos. B. N. O., 2015, P. 176; Chataigner. C, et al., 2012, P. 40; Arimura. K, et al., 2009, P. 18.

⁵¹ - Badalyan. R, et al., 2007, P. 47; Badalyan. R. S, et al., 2010, P. 194; Varoutsikos. B. N. O., 2015, PP. 192, 193.

⁵² - Chataigner. C, et al., 2015, P. 4; Varoutsikos. B. N. O., 2015, P. 177, 203-204; Chataigner. C, et al., 2012, P. 42; Arimura, et al, 2018, P. 5; Martirosyan-Olshansky, K., 2018, P. 182; Palumbi. G., et al, 2014, P. 45; Badalyan. R, et al., 2007, P. 43; Badalyan. R. S, et al., 2010, P. 194.

⁵³ - Petrosyan. A, et al., 2018, P. 39; Chataigner. C, et al., 2015, P. 4; Varoutsikos. B. N., 2015, P. 177; Chataigner. C, et al., 2012, P. 42.

⁵⁴ - Petrosyan. A, et al., 2018, P. 39.

⁵⁵ - Martirosyan-Olshansky. K, et al., 2013, P. 146; Martirosyan-Olshansky. K., 2015 b, P.14; Varoutsikos. B. N., 2015, P. 139, 192, 193, 203; Martirosyan-Olshansky. K., 2015 a; Martirosyan-Olshansky, K., 2018, PP. 78-79; Harutyunyan. A and Badalyan. R., 2014, P. 164; Badalyan. R, et al., 2007, P. 43; Badalyan. R. S, et al., 2010, P. 194.

5. Pottery:

Pottery didn't find in the oldest level of Neolithic villages in Ararat plain, then appeared in few quantities in the levels related to Late Neolithic. In level I "Aratashen" few reddish brown to black /grayish brown vessels (chaff and minerals tempered) have been discovered, decorated with simple knobs. Only one complete reddish brown vessel found with rounded rim and irregular body, the vessel has traces of fire ⁽⁵⁶⁾.

In "Aknashen" pottery classified into three groups (Fig. 13): 1- chaff tempered wares with organic inclusions; represented by bowls and basins, necked pots, curved pots; poor fired polished with round flat bases decorated with knobs under rim and geometric motifs. 2- Grit tempered wares with minerals inclusions, in general coarse and usually have cracks, represented by cylindrical vessels and barrel shaped, undecorated with impression of basket on bases and lower parts, sometimes have handles. 3- Grit tempered II wares with chaff and minerals inclusions, with flat bases polished carefully, represented by hole mouth jars, vessels, and low necked jars ⁽⁵⁷⁾.

A small amount of painted pottery sherds uncovered in "Aratashen and Aknashen" obviously imported from North Mesopotamia due to its similarity to Samarra culture's pottery ⁽⁵⁸⁾. Some clay circular discs found, the suggested use as whorls and polishers ⁽⁵⁹⁾.



Fig. 13: Pottery from Aknashen, after Badalyan. R and Harutyunyan. A, 2014, Fig. 6.

⁵⁶ - Vartoutsikos. B. N, 2015, PP. 198-199; Arimura. M, et al., 2010, P. 81; Badalyan. R, et al, 2007, P. 43; Badalyan. R, et al., 2004, PP. 409-410.

⁵⁷ - Badalyan. R., et al, 2010, PP. 191-193; Varoutsikos. B. N. O., 2015; P. 185; Harutyunyan. A, 2014, PP. 192-193.

⁵⁸ - Badalyan. R. S, et al, 2010, PP. 193, 194

⁵⁹ - Harutyunyan. A, 2014. P. 194.

6. Bone Tools:

Drills, pointed and denticulated tools, scrapers, spoons, spatulas, needles, pins, hoes, hammers, were found in “Masis blur and Aratashen” (Fig. 14); they used in food preparation, wood working, hide works, basketry ⁽⁶⁰⁾. Tools in “Aknashen” include needles, bone blade, drills, wide plates, digging tools with hole (to insert in a handle) ⁽⁶¹⁾.



Fig. 14: Bone tools from Masis blur. after, Hayrapetyan. A, et al., 2014, Fig. 9.

7. Ground Stone:

There are not a lot of ground stones in Armenia. Grinding stone of tuff, quern of basalt “in saddle shape”, and basalt knife are found in “Lernagog”; stone mortars of basalt and grinding slabs are found in “Tsaghkunk” ⁽⁶²⁾. In the agricultural villages the ground stone were a lot little bit, in “Aratshen” (Fig. 15) there were many tools made of basalt, tuff, siliceous stone “green, black, sand stone, and serpentine” represented by mortars, polished axes, querns, grooved stones, pestles ⁽⁶³⁾. In “Aknashen” (Fig. 16); quern (saddle shape), flat grinders, hand stones, cylindrical pestles, mortars, stone axes, polishing tools, grooved scrapers, holed axes (hoes), mace head are found made of basalt, tuff, sand stone, serpentine, granite, in addition to seal (Fig. 17) of green stone ⁽⁶⁴⁾.

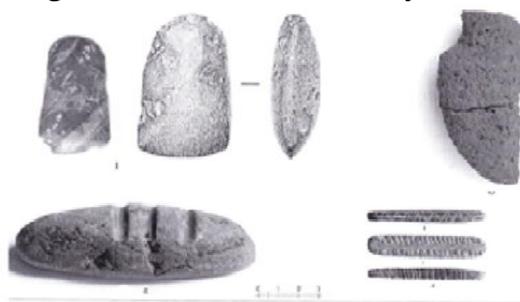


Fig. 15: ground stone Aratashen (after Badalyan. R, et al., 2007, Fig. 7.

⁶⁰ - Martirosyan-Olshansky. K., et al., 2013, P. 146; Martirosyan-Olshansky, K., 2018, PP. 82-83; Martirosyan-Olshansky. K., 2015 b, P.12; Hayrapetyan. A, et al., 2014, P. 181-182; Vartoutsikos. B. N. O., 2015, P. 199; Arimura. M, et al., 2010, P. 80; Badalyan. R, et al., 2007, P. 49; Badalyan. R, et al., 2004, P. 406.

⁶¹ - Badalyan. R. S, et al., 2010, P. 199- 200; Christidou. R., 2017.

⁶² - Arimura, et al., 2018. P. 5; Petrosyan. A, et al., 2018, P. 36.

⁶³ - Badalyan. R, et al., 2007, P. 51.

⁶⁴ - Badalyan. R. S, et al., 2010, PP. 197-198; Varoutsikos. B. N. O., 2015, P. 186, 188.

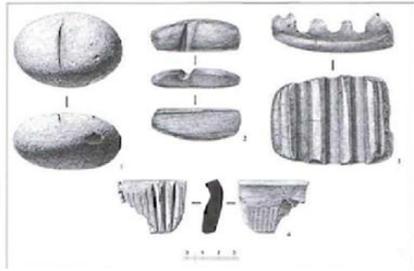


Fig. 16: grooved stone Aknashen after Badalyan. R, et al., 2010, Fig. 13.1.



Fig. 17: polished rectangular seal Aknashen. after Badalyan and Harutyunyan, 2014, Fig. 7-3.

8. Ornaments:

Ornaments in Armenia made of various material stone, bones (animals, birds), shell, and animals teeth. In “Kuchuk” two beads of Serdolyite ⁽⁶⁵⁾, Stone beads and bone pendant in “Lernagog 1” ⁽⁶⁶⁾ (Fig. 18), in “Masis blur” discoid beads and drop shaped pendants of stone, shell, bone, in addition to nacre ⁽⁶⁷⁾ (Fig. 19). In all Neolithic horizons in “Aknashen”, white antigorite and bone (of birds and fish vertebrae) beads; animal teeth and shell pendants as well as incomplete stone pendant ⁽⁶⁸⁾.

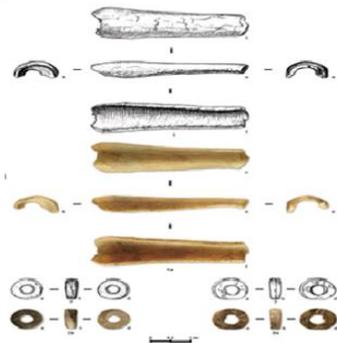


Fig. 18: stone and bone ornaments – Lernagog 1.

(after Arimura. K, et al., 2018, Fig. 13)



Fig. 19: stone, bone, and shell ornaments masis blur.

(after Arimura. K, et al., 2018, Fig. 13).

9. Animal Remains:

The animal remains in the early Neolithic sites of Armenia indicated to wild species, the remains of “kulan” bones in “Gegarot”, remains of “equidae” in “Lernagog” ⁽⁶⁹⁾, in “kmlo 2” the wild species’ were (wild boar, red deer, ox) also

⁶⁵ - Petrosyan. A, et al., 2014, P. 140.

⁶⁶ - Petrosyan. A, et al., 2014, P. 140; Arimura, et al, 2018, P. 5.

⁶⁷ - Varoutsikos. B. N. O., 2015, P. 139; Martirosyan-Olshansky, K., 2018, P. 85.

⁶⁸ - Badalyan. R. S, et al, 2010, PP. 198-199.

⁶⁹ - Petrosyan. A, et al., 2014, P. 142; Khechoyan. A and Gasparyan. B., 2014, P. 318; Arimura, et al, 2018, PP. 5-6.

some domesticated remains found include bovid ⁽⁷⁰⁾. So far from that in the agricultural villages the domesticated remains increased and the wild remains decreased. In “Masis blur” the animal remains represented by wild caprine, cattle, ox, wild boar, red deer, hares, hedgehog, tortoise and fishes ⁽⁷¹⁾.

The economy of Aratashen depended on animals breeding, in particular sheep and goat, beside fish and few amount of birds, and there were evidence of eating dogs, the wild species were deer, fox, hare, bear, wild boar and ox. Hunting doesn't play important role in the economy of Aknashen which depended on animals breeding, the domesticated animals represented by sheep, goats, cattle, dogs, and pigs; the wild animals are wild boar, ox, red deer, horse, hare, wolf, sable, hedgehog, fishes and birds in few quantities ⁽⁷²⁾.

10. Plant remains (residues):

The natural vegetation varied, included the wild and domesticated plants. In “Kmllo”, hackberry and wild cherry trees were found ⁽⁷³⁾. In “Masis blur”; *Hordeum sativum* (barley), *triticum* sp. (wheat), bitter vetch, were found in addition to *Vitis* sp. (grapevines, grapes seeds) which suggests wine production in the site ⁽⁷⁴⁾. In “Aratashen” the plants residue depended on *Hordeum sativum*, *triticum* sp., bitter vetch, leguminous, lentils, *Alyssum* and *Camelina* (used to obtain oils), *Cyperus fuscus* and *Bolboschoenus maritimus* (used in basketry, animal feed, the seeds were edible), the trees were Maple, Oak, Almond. The plant residues in “Aknashen” were the same to “Aratshen” in addition to *Bromus*, *Capparis spinosa*, *Phlomis viscosa*, *Amaranthus*, *Rumex* (Polygonaceae), and *Buglossoides arvensis* ⁽⁷⁵⁾.

11. Mining:

Although metals appeared in Chalcolithic, the beginning of metal's use in Armenia were found in the agricultural villages during the Neolithic. In “Masis blur” parts of azurite, malakhite, and hematite were found ⁽⁷⁶⁾, in “Aratashen” parts of azurite and malakhite, and iron hydroxide in addition to copper in the form of a

⁷⁰ - Petrosyan. A, et al., 2014, P. 137; Chataigner. C, et al., 2015, P. 3; Varoutsikos. B. N. O., 2015, P. 177.

⁷¹ - Martirosyan-Olshansky, K., 2018, PP. 77-78; Martirosyan-Olshansky. K, et al., 2013, P. 146; Martirosyan-Olshansky. K., 2015 b, P.13; Hayrapetyan. A, et al., 2014, P. 182.

⁷² - Badalyan. R, et al., 2007, PP. 53 – 56; Badalyan. R, et al., 2010, PP. 201- 202; Vartoutsikos. B. N. O., 2015, P. 189, 190, 201, 202; Vila. E, et al., 2017, P. 100, 103, 110.

⁷³ - Petrosyan. A, et al., 2014, P. 137; Chataigner.C, et al., 2015, P. 3; Varoutsikos. B. N. O., 2015, P. 177.

⁷⁴ - Martirosyan-Olshansky. K., et al, 2013, P. 146; Varoutsikos. B. N. O, 2015, P. 139; Martirosyan-Olshansky, K., 2018, P. 77.

⁷⁵ - Badalyan. R, et al, 2007, PP. 58-59; Hovsepyan. R, 2004, P. 123; Vartoutsikos. B. N. O., 2015, PP. 190-191, 202; Badalyan. R. S, et al, 2010, P. 203.

⁷⁶ - Martirosyan-Olshansky, K., 2018, P. 85.

bracelet consisting of 57 pieces of copper weighing about 12.5 g ⁽⁷⁷⁾. In “Aknashen”, copper in the form of ring (under a dead head), part of copper bead “in horizon 5”, many parts of green malachite, blue azurite were found ⁽⁷⁸⁾.

12. Stone pots:

The stone pots were rare in South Caucasus during Neolithic, half pot of perolite found in "Aratashen" and flask of felsite ⁽⁷⁹⁾.

13. Commercial Connections:

Many finds in South Caucasus point to some relations with neighbors' areas, represented by some painted pottery sherds which are similar to Samarra culture's pottery in North Mesopotamia which may suggests imported or commercial exchange ⁽⁸⁰⁾, in addition to seals that found in “Masis blur, Aknashen” and considered as evidence of trade exchange and foreign relations.

14: Rock art:

There are few rock engravings in South Caucasus. Gaghamavan 1 cave ⁽⁸¹⁾ or “the Red cave” (as called by the native people due to the red paintings which obtained from iron oxides existing at the end of the cave), found in Armenia ⁽⁸²⁾. The paintings cover about 20m ⁽⁸³⁾, the Neolithic paintings dominated by animal scenes (Fig. 27), which represented by caprines, horses, and roe deer and carried out by simple line and few anatomical features; some scenes show domestication scenes represented by human tied a rope around an animal's neck and the milking scenes (Fig. 20). Human scenes are very few and carried out by simple line usually clarifying the

⁷⁷ - Chataigner. C, et al., 2014, P. 16; Vartoutsikos. B. N. O., 2015, P. 200; Badalyan. R, et al., 2007, P. 52.

⁷⁸ - Badalyan. R. S, et al., 2010, P. 199.

⁷⁹ - Badalyan. R, et al., 2007, P. 52.

⁸⁰ - Vartoutsikos. B. N. O., 2015, PP. 198-199; Arimura. M, et al., 2010, P. 81; Badalyan. R, et al., 2007, P. 43; Badalyan. R, et al., 2004, PP. 409 - 410.

⁸¹ - located to the Northwest of the capital “Yerevan” and about 70km to the Southwest of the left bank over Kasakh river valley. It was studied as part of the cooperated mission of French ministry of foreign affairs and the archaeology and ethnography institute of the national academy for science headed by Chataigner and Gasparyan. The site studied completely in 2002-2003 by French Armenian mission. The cave opens from South West, the covered part is about 4 long and 11m wide, due to the sun it was not suggested as residence place.

- Feruglio. V, et al, 2005, P. 1; Khechoyan. A and Gasparyan. B, 2014, PP. 315-316; Khechoyan. A, 2007, PP. 247-248.

⁸² - Khechoyan. A., 2007, P. 248; Khechoyan. A and Gasparyan. B., 2014, P. 316.

⁸³ - Feruglio. V, et al, 2005, P. 2.

hunting tools (like bow) ⁽⁸⁴⁾.



Fig. 20: Rock carvings- Geghamavan 1.
after, Khecgoyan. A and Gasparyan. B., 2014, Fig. 5. 1,
2.

15. Observatory:

Zorates Karer (or Karahunj) is one of the most unique archaeological sites in South Caucasus dating back to Neolithic. It was suggested as an observatory to observe stars and celestial bodies (orbits) ⁽⁸⁵⁾. The site consists of stones (pillars/monoliths) (around 223) with height from 1m to 3m, some stones (about 84) have circular holes with diameter 1, 9 – 2, 7 inch. Despite the fall down of many stones, the largest number is still standing in its place (Fig. 21) ⁽⁸⁶⁾.

The site consists of “central area” containing 40 stones, located to the North “the Northern wing” which consisting of 80 stone (about 49 contain circular holes on its top), and to the South “the Southern wing” which consisting of 70 stones (about 49 have holes on its top), the “Northwestern road” has 8 stones pointed to the sunrise point on the summer solstice day, the “Cord” which is a path that passes the “Central area” and connects the “Northern and Southern wings”, the Cord consists of 20 stones (6 of them have holes), in addition to some scattered stones ⁽⁸⁷⁾.

Heroni dated the site to 7500 years ago, which means that the site dated to Neolithic period in Armenia, and even older than “Stonehenge” observatory in England ⁽⁸⁸⁾. Scientists concluded that the site is an astronomical observatory (perhaps also a school to teach the astronomy), the stones are astronomical tools (to observing the movement of stars, planets, the moon, and the sun), and short and

⁸⁴ - Feruglio. V, et al., 2005, P. 3; Khechoyan. A., 2007, P. 248.

⁸⁵ - located in South Armenia 150 km from the capital, its area about 7 hectare, it was detected many times from 1994-2001.

Khachatryan. J., 2013, p. 330; Fullilove. C., 2017, P. 1; Joseph. F., 2011, P. 4; González- García. C. A., 2015, P. 1453.

⁸⁶ - Joseph. F., 2011, P. 4; Simonia. I and Jijelava. B., 2015, PP. 1448- 1449.

⁸⁷ - Ayrapetyan. A, 2015, PP. 22-25; Klimczak. N., 2016.

⁸⁸ - Ayrapetyan. A, 2015, P. 37; Joseph. F., 2011, PP. 6, 8; Gasparyan. A, et al, 2016, P. 694.

medium stones to measure and observe the planets' movement. This was supported in 2010 after an overall study to the site by an expedition from Oxford University and the Royal Geographical Society, because the alignment of the stones is agree with the sunrise of the sun, the moon, and many stars ⁽⁸⁹⁾.

Scientists also concluded that the Northern road points to the sunrise at the summer solstice, the Southwestern access used to observe the sunset at the winter solstice, some stones rows parallel to stars' height, and some stones were directed toward the Deneb star group (Cygnus constellation) ⁽⁹⁰⁾. Some of the stones are still till now performing its function, for example the beginning of the year (according to the old Armenian calendar) in 21st of March can be determined through the hole in the stone number 62 whose directed to the top of the stone 63 which the sun is perpendicular to it from the right side at noon at a certain time of the year. The stone 63 may have been used as sundial, stone 17 used to observe the sun, stones 65, 161, 187 are used to observe the summer solstice and stones 97, 98, 100 are used to observe the winter solstice, stones 40, 55, 63, 64, 67, 79 used to observe sunrise and sunset during spring and autumn ⁽⁹¹⁾. Many stones have engravings of animals, hunting and humans raising their hands (Fig. 22).



Fig. 22: Stone decorated with carvings – Zorates Karea, after

https://www.tripadvisor.com/Attraction_Review-g1055321-d1036334-Reviews-Karahundj_Armenia_s_StonehengeSisian_Syunik_Province.html#photos:aggregationId=101&albumid=101&filter=7&ff=141420374 last accessed 30/5/2018.



Fig. 21: Stone 60, 62, 63, Zorates Karer
After. Hayrapetyan. A, 2015, P. 26.

⁸⁹ - Simonia. I and Jijelava. B., 2015, PP. 1449; Ayrapetyan. A, 2015, PP. 38-39.

⁹⁰ - Joseph. F., 2011, P. 10.

⁹¹ - Ayrapetyan. A, 2015, PP. 26, 27, 45, 46.

16. Conclusion and Results:

- Although the excavated buildings indicating residential purpose, some of them have special functions, for example; for economic nature such as building S004 in “Masis blur” and buildings (47, X) in “Aratashen” used as industrial workshops, as well as the concave building in “Aratashen” which used for agricultural purposes (crop threshing). There were also spaces (yards) for social activities in “Aratashen”, perhaps food preparation, and they contained stores or perhaps barns for livestock.
- It is noted that the population exploited the available materials around them in the environment (clay from the plains and rivers) for construction in the form of blocks or slabs of clay, as well as mud bricks which were used little in the late period of the Age "level IIa in Aratashen" and was characterized by thickness and roughness.
- It is likely that people in this ancient period affected by the climatic conditions and tried to adopt with the climate by inventing a distinctive building technique as a Thermal insulator that enable them to keep the temperature inside the building, as in "Masis blur".
- Despite the spread of the circular plan in building construction, the rectangular plan was found in the lowest levels in "Aknashen" before the appearance of the circular plan, which suggested connections with Mesopotamia in which this plan dominates (7th – 6th Mill B.C.), this also suggested that the inhabitants of Aknashen were new comers, didn't inhabit and develop in it, but rather they came with their civilization and settled in this place.
- Despite the lack of the uncovered burials in Armenia, the practice of separating skulls distinguished through the headless burial in “Masis blur”, as well as the skull uncovered in “Aknashen”. The skulls maybe suggest influence and interaction with the ancient Near East in the habit of “skull separation” .The skull of “Aknashen” indicates a development in medicine due to the presence of what looks like suturing a wound in it, also indicates to some battles took place in the ancient societies (even it was in the same tribe or other tribes). As well as, the presence of some funerary goods with the burials, the presence of red ocher indicate to religious beliefs and the desire to protect the dead.
- The lack of microlithic tools and the abundance of the agricultural tools in the late (agricultural villages) indicates a decline in hunting activity and the

dominance of agriculture. On the contrary, in the early sites the hunting tools were abundant.

- The large minority of nuclei suggested it prepared outside the sites and brought ready.
- The grooved stone tools that were found in the agricultural villages “Masis blur, Aratashen, Aknashen” are similar to those found in Anatolia and Iraq.
- Some uncovered finds in Armenia suggested commercial exchange carried out, such as the presence of seals at “Masis blur and Aknashen”, as well as the small number of fine colored pottery which is similar to the pottery of the Samarra culture in Northern Mesopotamia (not to Armenia’s Neolithic Pottery).
- The great lack, or rather the scarcity of stone vessels, as well as the complete failure (so far) to find statues during the Neolithic in Armenia.
- People interested in the arts, especially ornaments (beads, pendants, necklaces and bracelets) with various materials perhaps for decoration, as well as the belief in its magical protection, so they place beads and pendants with the dead as funerary goods.
- The presence of basalt mace head in “Aknashen” suggests a system of government in the village, and perhaps it belongs to the ruler.
- The rock engravings discovered in the rock shelter “Geghamavan 1”, as well as those on the stones at the Zorats Karir, show the practice of hunting activities, as well as the practice of some types of magic rituals (ritual dance), perhaps to facilitate the hunting process.
- The engravings shows the types of animals in the Neolithic in Armenia, including equids (horses), caprines (ibex), deer, dogs and cattles. As well as attempts to domesticate animals and the hunting’s tools, including bows, ropes and arrows.
- The rock engravings at “Geghamavan 1 and Zorats Karir” show different methods of execution: the painting in red in “Geghamavan”, and the grooving (notching) style in Zorats Karir.
- The presence of the Zorats Karir Observatory demonstrates the development of astronomy in Armenia during Neolithic.

17. Bibliography:

- الشيباب، عبد الحليم وأبو غنيمه، خالد. (2012): أرقام وأعداد: إشارات ورموز من العصر الحجري الحديث ما قبل الفخاري في بلاد الشام، المجلة الأردنية للتاريخ والآثار، المجلد 6، العدد 2، ص 155-178.
- **Aknashen-Khatunarkh** : un site néolithique dans la plaine de l'Ararat (Arménie), Mission archéologique « Caucase» 1997-2017, Dossier de candidature au « Prix CLIO 2017 », Dossier présenté par Bérengère PERELLO CNRS (UMR 5133, Archéorient).
- **Arimura. K, et al., (2009)**. Kml0 2 An Early Holocene Site in Armenia, NEO-LITHICS, Vol. 2, PP. 17-19.
- **Arimura. M, et al., (2010)**. Current Neolithic Research in Armenia, NEO-LITHICS, The Newsletter of Southwest Asian Neolithic Research, Special Topic on Conflict and Warfare in The Near Eastern Neolithic, Vol. 1, PP. 77-85.
- **Arimura. M., et al., (2018)**. A Preliminary report on the 2015 and 2017 field seasons at the Lernagog-1 site in Armenia, ARAMAZD Armenian Journal of Near Eastern Studies, Vol. XII, Issue. 1, Yerevan, PP. 1-18. <http://hayernaysor.am/en/archives/270568>
- **Ayrapetyan. A, (2015)**. "Carahunge" Sensational Discovery of our Days, Under the Editorship of Bachkaryov. N.G. and Sorokoletova. Y., 3rd edition, Moscow Gvarga, (in Armenian Language), PP. 1-32.
- **Badalyan. R, and Harutyunyan. A (2014)**. Aknashen – The late Neolithic Settlement of the Ararat Valley: Main results and prospects for the research, PP. 161:176, **in:** Gasparyan. B and Arimura. M: Stone Age of Armenia, Institute of Archaeology and Ethnography of the National Academy of Science, Kanazawa University.
- **Badalyan. R, et al., (2004)**. The Neolithic and Chalcolithic Phases in the Ararat Plain (Armenia): The View from Aratashen, in: Sagona. A: A View from The Highlands Archaeological Studies in Honour of Charles Burney, Ancient Near Eastern Studies, Supplement 12, Peeters, PP. 399-420.
- **Badalyan. R, et.al, (2007)**. New Data on the Late Prehistory of the Caucasus. The Excavation at Aratashen (Armenia): Preliminary Report, Les Cultures Du Caucase (VI^e -III^e Millenaires avant notre ere) Leurs relations avec le Proche-Orient, Editions Recherche sur les Civilisations, CNRS Editions, PP. 191-200.
- **Badalyan. R., et al, (2010)**. The Settlement of Aknashen-Khatunakh, A Neolithic Site in the Ararat Plain (Armenia): Excavation Results 2004-2009, TÜBA-AR, Vol. 13, PP. 187-220.

- **Chabot. J., (2017).** Industrie néolithique de longues lames en obsidienne, l'exemple d'Aknashen-Khatunarkh (Arménie, début du VI^e millénaire): sur la piste des premiers débitages par pression, *Journal of Lithic Studies*, Vol. 4, Nr. 2, PP. 1-17.
- **Chabot. J and Pelegrin. J, (2013).** Two Examples of Pressure Blade Production with a Lever: Recent Research from the Southern Caucasus (Armenia) and Northern Mesopotamia (Syria, Iraq), in *Desrosiers. P: The Emergence of Pressure Blade Making, From Origin to Modern Experimentation*, PP. 181-198. DOI 10.1007/978-1-4614-2003-3_6
- **Chataigner. C, et al., (2012).** From the Late Upper Paleolithic to the Neolithic in North-Western Armenia: Preliminary results, in: *Avetisyan. P. (ed.), Proceedings of the International Conference "The Archaeology of Armenia in a regional, Context: Results and Perspectives, Yerevan, 14-19 September 2009*, PP. 37- 43.
- **Chataigner. C., et al, (2014).** The Neolithic of the Caucasus, *Oxford Handbooks Online* (www.oxfordhandbooks.com), Oxford University Press.
- **Chataigner.C, et al., (2015).** Neolithic and Chalcolithic in Armenia: New Data, in: *İşıklı. M and Can. B: International Symposium on East Anatolia South Caucasus Cultures, Proceedings I, Cambridge Scholars Publishing*, PP. 2-15.
- **Christidou. R., (2017).** Les outils néolithiques en os d'Aknashen, in: <https://archeorient.hypotheses.org/8029>
- **Feruglio. V, et al, (2005).** The Geghamavan-1 Painted Shelter Aragatsotn Province Republic of Armenia, *International Newsletter on Rock Art "INORA"*, No. 41, 1-7.
- **Fullilove. C., (2017).** The Profit of the Earth: The Global Seeds of American Agriculture, *University of Chicago Press, United States of America*, PP. 1-13.
- **Gasparyan. B and Petrosyan. A., (2015).** Tools with an Abrupt, Regular, Sub-Parallel Retouch from the Armenian Highlands and the Near East: "Apnagyuagh Tools", "Lekala" or "Hook-Like Tools" and çayönü Tools, in: *ARAMAZD, Armenian Journal of Near Eastern Studies*, Vol. IX, Issue. 2, PP. 21-30.
- **Gasparyan. A, et.al (2016).** Additions to the Lichenized and Lichenicolous Mycobiota of Armenia, *Herzogia* 29 (2), Teil 2, PP. 692- 705.
- **González- García. Cèsar. A. (2015).** Carahunge – A Critical Assessment, PP. 1453-1460, in: **Ruggles, Clive L.N. (Ed.), Handbook of Archaeoastronomy and Ethnoastronomy, Part VIII, School of Archaeology and Ancient History**

University of Leicester, Springer Reference.

- **Hayrapetyan. A, et al, (2014)**. Preliminary Results of the 2012 Excavations at the late Neolithic Settlement of Masis Blur, in: Gasparyan. B and Arimura. K (eds.), The Stone Age of Armenia: A Guide-book to the Stone Age Archaeology in the Republic of Armenia, Monograph of the JSPS-Bilateral Joint Research Project., Center for Cultural Resource Studies, Kanazawa University, Kanazawa, Japan, PP. 177-190.
- **Hosh. T, et al., (2014)**. Russia's Role in the Official Peace Process in South Ossetia, Bulletin of Geography, Socio – Economic Series, No. 23, PP. 53-71.
- **Hovsepyan. R, (2004)**. Archaeobotanical Finds of Six-Rowed Barleyv (Hordeum Vulgare) from the Neolithic Layers (7th – 6th Millennia B.C.) of the Aratashen Settlement of Armenia, in Flora Vegetation and Plant Resources of Armenia (Флора Растительность и растительные ресурсы Армении), Issue. 15 (Выпуск пятнадцатый), PP. 123-125.
- **Joseph. F., (2011)**. Analyzing a Massive Megalithic Mystery: Armenian Stonehenge Confounds Scholars, The Barnes Review (www.Barnesreview.com), Vol. XVII, No.4, PP. 4-11.
- **Khachatryan. J., (2013)**. Sisian (Sisavan), Newsletter of Public Sciencies, Հնչարհատնութնութն ԵՎ Ազգագրոնութնութն (Archaeology and Ethnography), № 1, PP. 330-334.
- **Khechoyan. A., (2007)**. The Rock Art of the Mt. Aragats System, in: Rock art in the frame of the Cultural Heritage of Humankind PAPERS, XXII Valcamonica Symposium 2007 Darfo Boario Terme (Bs) Italy 18th – 24th May 2007, PP. 247-252.
- **Khechoyan. A and Gasparyan. B, (2014)**. Rock Paintings Phenomenon in the Republic of Armenia, PP. 315 – 337, in: Gasparyan. B and Arimura. M, Stone Age of Armenia, A Guide-book to the Stone Age Archaeology in the Republic of Armenia, Institute of Archaeology and Ethnography of the National Academy of Sciences of the Republic of Armenia, Monograph of the JSPS-Bilateral Joint Research Project Center for Cultural Resource Studies, Kanazawa University, PP. 315- 337.
- **Klimczak. N., (2016)**, in: <https://www.wondermondo.com/karahunj-zorats-karer/> last accessed 18/3/2021.
- **Martirosyan. K., et al, (2013)**, Masis Blur: A Late Neolithic Settlement in the Plain of Ararat Armenia, Report from the Field, Backdirt, PP. 142-146.

- **Martirosyan-Olshansky. K., (2015 a)**, Provenance Study of Obsidian Artifacts from the Neolithic Settlement of Masis Blur (Armenia) Using Portable X-ray Fluorescence Spectrometry, Society of Armenian Archaeology 8th Annual Masis Meeting, San Francisco, CA, April 15-April 19 2015. In: file:///C:/Users/dell/Downloads/Provenance_Study_of_Obsidian_Artifacts_f.pdf
- **Martirosyan-Olshansky. K., (2015b)**, Masis Blur: A Neolithic Settlement in Ararat Plain, Armenia, PP. 1- 26, (online), <https://www.researchgate.net/publication/263469664> last accessed 17/6/2019
- **Martirosyan-Olshansky, K., (2018)**. Obsidian Economy in the Armenian Highlands during the Late Neolithic A View from Masis Blur, Doctoral Dissertation of Philosophy in Archaeology, University of California, Los Angeles.
- **Perello. B., (2017)**, Aknashen-Khatunarkh : un site néolithique dans la plaine de l'Ararat (Arménie), Mission archéologique « Caucase » 1997-2017, Dossier de candidature au « Prix CLIO 2017 », CNRS (UMR 5133, Archéorient), PP. 2- 12.
- **Petrosyan. A, et al., (2014)**. Early Holocene Sites of the Republic of Armenia: Questions of Cultural Distribution and Chronology, in: Gasparian. B and Arimura. M, Stone Age of Armenia, Institute of Archaeology and Ethnography of the National Academy of Sciences of the Republic of Armenia, Kanazawa University, PP. 135-159.
- **Petrosyan. A, et al., (2018)**, Some Notes on Lithic Materials from Tsaghkunk, A Neolithic – Chalcolithic Site in the Ararat Plain, Armenian Journal of Near Eastern Studies , Vol. XII, No. 1, PP. 35-50.
- **Poulmarc'h. M., (2014)**, Pratiques funéraires et identité biologique des populations du Sud Caucase, du Néolithique à la fin de la culture Kura-Araxe (6ème - 3ème millénaire av. J.-C.): une approche archéo-anthropologique, Thèse Pour obtenir le grade de Docteur, Université Lumière Lyon 2, Volume 1.
- **Poulmarc'h. M and Le Mort. F., (2015)**. Diversification of the funerary practices in the Southern Caucasus from the Neolithic to the Chalcolithic, Quaternary International, Vol. xxx, PP. 1-10.
- **Simonia. I and Jijelava. B., (2015)**, Astronomy in the Ancient Caucasus, Handbook of Archaeoastronomy and Ethnoastronomy. **Ruggles, Clive L.N.** (Ed.), Handbook of Archaeoastronomy and Ethnoastronomy, Part VIII, School of Archaeology and Ancient History University of Leicester, Springer Reference,

P. 1443- 1460.

- **Smith. A. T, et al., (2009).** The Archaeology and Geography of Ancient Transcaucasian Societies, Volume I, The Foundations of Research and Regional Survey in the Tsaghkahovit Plain Armenia, Oriental Institute Publications, Vol. 134, The Oriental Institute of University of Chicago.
- **Varoutsikos. B. N. O., (2015),** The Mesolithic – Neolithic Transition in the South Caucasus: Cultural Transmission and Technology Transfer, PhD Thesis, Harvard University, Cambridge, Massachusetts.
- **Vila. E, et al, (2017).** Neolithic Subsistence Economy in the Plain of Ararat: Preliminary Comparative Analysis of the Faunal Remains from Aratashen and Khatunarkh-Aknashen (Armenia), in: Mashkour M. and Beech M. (eds.), Archaeozoology of the Near East IX, Proceedings of the 9th International Symposium on the Archaeozoology of southwestern Asia and adjacent areas, Oxbow Books, Oxford, Philadelphia, PP. 98-111.

17.2: The Internet Websites:

https://www.tripadvisor.com/Attraction_Review-g1055321-d1036334-Reviews-Karahundj_Armenia_s_StonehengeSisian_Syunik_Province.html#photos;aggregati onId=101&albumid=101&filter=7&ff=141420374 last accessed 30/5/2018.

<http://hayernaysor.am/en/archives/270568> last accessed 11/7/2019