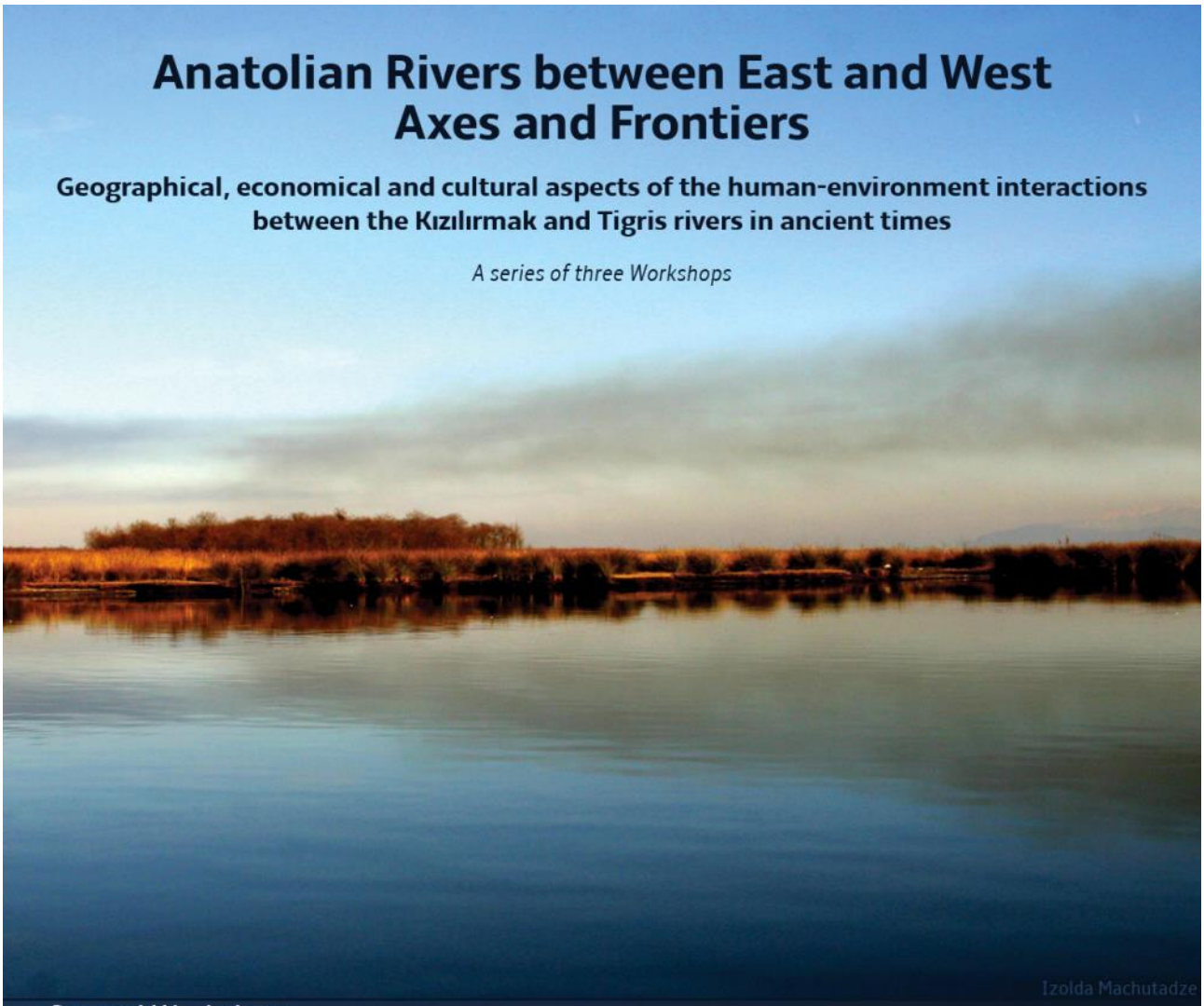
Anatolian Rivers between East and West
Axes and Frontiers

Geographical, economical and cultural aspects of the human-environment interactions between the Kızılırmak and Tigris rivers in ancient times

A series of three Workshops



Second Workshop

The Exploitation of the Economic Resources of Rivers

Batumi Shota Rustaveli State University

Venue

5th May 2017
9:30 AM
Faculty of Humanities
Room #37

6th May 2017
10:00 AM
Poti, Kolkheti National Park
Administration office – Conference Room

Organizing committee

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The Akampsis - Tchorokhi - Çoruh: A Frontier and a Navigation Road

The Akampsis in classical texts

In the works of ancient writers we hear very little of the Akampsis. It had none of the associations that attracted such writers to the Phasis, for example, which was associated with important myth, was regarded as a division of the earth and was also a strategic highway from the Pontic coast towards Iberia and even India. The Akampsis was a major river, but it did not connect much with the priorities of such writers: we know of no myth specific to the Akampsis, while the river had scant wider importance as a key geographical boundary or as a highway to anywhere that such writers cared about. That is not to say, of course, that the river did not have any myths or did not divide and connect different areas. In short, the neglect of the Akampsis was symptomatic of the broader lack of much interest in the interior of the lands to the south east of the Black Sea. So much is apparent in the accounts given by the very few writers who have much to say about this area. The coastal strip eastwards from Trapezus was treated as a difficult and hazardous obstacle for the many ships that passed to and from Colchis (already attested in Xenophon's day, c. 400 BC): in that rather negative sense it mattered to the world at large and was settled by peoples with a place in classical culture (however unpleasant – the Chalybes, Sanni and the like). By contrast the interior, beyond the mountains that fenced off the narrow coastal strip, was of no particular interest to the classical Greek world, and only a little more in early Byzantine times. The Roman empire left the interior to indirect rule, by and large. Imperial military bases were installed along the coast largely with a view to the protection of shipping and the prevention of raids upon coastal settlements around the region. It is not at all clear that such arrangements worked very well: even Strabo seems to complain about its inadequacy.

In Greek sources our earliest mention of the Akampsis comes with Arrian's account (*Periplus,* 7). It was his military and administrative duties that brought his attention to the region at all c. AD 132. The Akampsis for him is important as a landmark of the coast. He has nothing to say about connectivity with the interior, for example, even though that involved Pharasmanes II of Iberia, as he mentions in passing. We might have expected more from a governor of Cappadocia, whose province took in more than the coastal strip. Meanwhile the absence of the Akampsis from the whole tradition of earlier Greek geography is remarkable, underlining its lack of interest for Greeks outside the region. However, Roman imperial government had become involved much earlier, so that it is a Latin writer, the elder Pliny, who in his *Natural History* of AD 77, provides our first ancient mention of the Akampsis. We can only guess at his sources on the river, which probably included the maps created by the Roman army of Corbulo, some twenty years earlier, which he certainly knew. However, while he has a lot to say about the Phasis, he does no more than mention the Akampsis, with other rivers, under the name *Acampseon* (*NH* 6. 12).

It is Procopius (*Wars,* 8. 2.6-8) who provides our best information, including important remarks not only about the strong impact of the river upon coastal shipping (cf. more general comments by Strabo), which is taken to explain its name (Akampsis = "Unbending", i.e. pushing ahead even into the sea, a local name), but also a little about the inland portion of the river, interestingly named Boas ("Roarer", like other ancient rivers; cf. the Qvirila etc.). As with Arrian and, most probably, Pliny, the perspective and concerns of Procopius are formed around matters of conflict and administration, which entail especially

practicalities at the very coast, above all. Even in the sixth century AD, it seems, writers from outside the region focus upon these same issues, and largely neglect the difficult hinterland, beyond the coastal mountains. If we had local accounts, we might have found a great deal about that interior. For we must be clear that the lack of interest in the economy etc. of the river Akampsis (or Boas) inland from the coast, and our consequent ignorance about it (not helped by limited archaeological investigations), must not be taken to mean that the river was any less a focus of local activity than most other rivers in antiquity. Clearly the Akampsis-Boas constituted a major highway through difficult terrain, for those who wished to travel its waters or along its banks or both, while the inhabitants of that interior were famously dangerous (Sanni, later Tzani). In fact, Procopius himself comes very close to making that point: we know little about the Akampsis away from the coast, but it offered major opportunities.

The fluvial transportation through Chorokhi/ Çoruh

The navigation on the Chorokhi/ has been studied the subject of a research at the time of the construction of the dams in Muratlı, Borçka and Deriner, which have changed the physiognomy of the river forever.[1] It played an important role in the economic and cultural life of Batumi region (comprising the Batumi and Artvin districts) in the 1880s. The river was used to transfer both cargo and passengers. Through this river-sailing channel, Batumi and Artvin districts contacted Batumi and other Black Sea ports. Local population could trade through this river.

The portion of the river Chorokhi/Çoruh from Artvin to the confluence of the river near Batumi was used for navigation. The boat of specific construction adjusted to the complex hydrographic conditions was used for this purpose. It was rather long, narrow and with flat bottom.[2] The "Chorokhi boats" sailed fast (4-6 hours during the high water period, usually 8-10 hours). On the way back, the boat was dragged up with ropes and it took 4-5 days to cover the distance to Artvin.

Due to rapid flow of Chorokhi and the complex rocky riverbed, it was difficult to navigate and it required great experience and braveness from the crew. In this regard, the Chorokhi boatmen were outstanding.

Boat-building was the main occupation for the population of the villages along the lower course of the river Chorokhi. Most famous in this respect were the villages of Kvemo (Lower) Maradidi, Borchkha/Borçka and Kheba (modern Karsiköy). There were about 20 dockyards in Maradidi. Supposedly, shipbuilding and navigation might have had ancient and longtime tradition on the river Chorokhi. The boats relevant to river sailing could be made only by the locals.

As Batumi became bigger industrial port from the 1870s, it promoted revival of fluvial transportation on Chorokhi. With the city development, the tendency to establish better connection between inner provinces and Batumi increased. The roads to the inlands of Batumi region were in poor condition. Therefore, Chorokhi river road was the only convenient transport artery in the region. This road helped to revitalize economic and agricultural activities of the Chorokhi valley and its further development. In the 1890s up to 300 boats served for Chorokhi sailing highway.

A large quantity of agricultural products was brought to Batumi through the river Chorokhi: wheat, honey, tobacco, cotton, olives, fruit and vegetables. Also, ceramic vessels, bricks, tiles - were imported from Borçka, as we shall see below. A large quantity of wheat was brought from Artaani/Ardahan and Kars. Mainly manufactory products, maize, kerosene

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1 Kakhidze 2004, pp. 63-67; Aytekin 2003, p. 9; Aytekin 2013, p. 61.

2 Aytekin 2003, p. 9; Aytekin 2013, p. 64. See Bryer and Winfield 1985, p. 19 et n. 12, who also comment the river route of the Çoruh: the boats would be 15 m long by 1,25 m and could carry a cargo of 6 to 8 tons (after the testimonies of 19th century travellers).

and the items of first need were brought from Batumi to Artvin. It should be noted that the Artvin merchants also imported various goods from abroad that were transported by boat from Batumi to Artvin, from there to Artaan/Ardahan, Kars in carts.

The intensive navigation revived the riverside villages. The cafes, hostels, were opened; fairs were held in the Fridays where domestic and art products were sold as well as agricultural products. Activation of navigation and trade reception gave rise to Artvin. It became the central settlement of the Chorokhi gorge. At the end of the 19th century, almost all the population of the valley was pursuing the navigation business. From 1903, after construction of the Batumi-Artvin road, the navigation gradually weakened on Chorokhi, but continued to be moderately intense until 1921.[3]

The ceramic tradition at Borçka and in the Eastern Black Sea: a production centre of amphorae in the 6th-7th centuries?

The ceramic production in Borçka

The tradition of ceramic production in Borçka is now extinguishing. However, only 30 years ago it was still vivid. The only potter in activity today is Kazım Şirin. He was born in 1929 and is from a family of potters who have transmitted the craft from generation to generation.[4] He remembers that in 1980s, still around 30 workshops were working in the district of Yeniyol, west of Borçka. The quarry of clay is situated on the bank of the Çoruh in the district so-called the Agora in Artvin. It is the only place where suitable clay for pottery can be found according to Kazım Şirin.

Nodar Kakhidze has done an extensive research about Borçka in relation with the ceramic production in the southwestern Georgia.[5] He is mentioning the tiles production in the 19th century until the World War I, which was well known for its quality. The production of ceramics was also important, among which a type of container for 1,5 litres should have been famous, since a unity of measurement in Georgia has been named "Borchkuli".[6] The products were widespread on the coastline from Hopa to Trabzon and from Batumi towards Kobuleti, and in the other regions of Tchorokhi valley in the Ajaristskali and Machakheli gorges. As Kazım Şirin remembers for his own ceramics, the production was sent by boat on the Çoruh to Batumi for a part, and to Hopa for another part, from where it was transported by sea along the coast.

The history of Borçka is not well documented. The first settlement is going back to 2000 BC with the Hurris.[7] After a complicate succession of occupations common to the valley of the Çoruh and to the southern part of Colchis, it has finally become a part of the Byzantine Empire under the rule of Justinian in 536 AD.[8] In the 10th-11th centuries, it was a part of the Empire of Trebizond and some scholars identified it as Bourzo or Soterioupolis.[9]

We do not know the date of the beginning of the production of the ceramics and of the use of the Çoruh for the transportation.[10] We couldn't find so far any publication or even references about an archaeological survey in that region.

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3 Some boats could still navigate until 1955 when a permission was given by Batumi.

4 Mr. Şirin has kindly shared in 2005 some aspects of his handicraft and of the oral tradition, which has been transmitted to him (Kassab Tezgör 2013, pp. 157-158, pp. 162-163, Fig. 5-7). He is also named in the article of Aytekin 2002, p. 9.

5 Khakidze 2004, pp. 84-99.

6 *Ibidem*, p. 96.

7 The more detailed summary of the history of the region of Borçka can be found in Özdemir 2002, pp. 11-27; see also Sinclair 1989, pp. 43-45.

8 Özdemir, pp. 29-30.

9 Kazhdan 1991, *s.v.* Soterioupolis; Sinclair 1989, p. 18; Bryer and Winfield 1985, p. 351.

10 Aytekin 2013, p. 64, suggests that it has begun at least at the Ottoman period. Kazım Şirin mentions that the pottery activity exists for 400 years, "since the Byzantine" period; he probably means that it is a very ancient tradition.

We should also note that all this area was a centre of ceramics, even if we do not have precise information. We can understand for example from the toponymy: the village Küre is named after the Georgian name: Kura (Qura), which means the kiln.[11]

The Colchian amphorae

The production of amphorae in Colchis has begun in the middle of the 4th century BC and has continued until the 6th-7th centuries.[12] These vessels are often designated under the general name of "brown-clay amphorae". It has been recently demonstrated by Sergey Vnukov that the brown clay amphorae attributed to Colchis are in fact divided into two groups all along their production.[13] The composition of the clay and of the temper differentiates them and corresponds to the geomorphology of the two distinctive geographical areas: one corresponds to the south-eastern Black Sea (from the area of Trabzon to the modern Adjara (fabric 1) and is the one which interests us here; the other one is originated from the central and northern Colchis (including today Abkhazia) (fabric 2). The pyroxene and the basaltic sand are considered as the markers of the fabric 1. After firing, the reddish colour is uniform, as the other fabric turns to an irregular colour from beige to orange on the same amphora. Besides these technical differences, through the centuries the shape and the morphological evolution stay the same for the amphorae of the two fabrics.[14]

Related to the production of the fabric 1, one kiln of amphorae has been identified in Apsarus:[15] it was firing amphorae from the 1st century BC to the 2nd century AD, and two in Archaeopolis-Nokalakevi which were most probably producing late Roman amphorae.[16]

We would like to present here a research laid, which will demand new investigations and verifications. Could at least a part of the production of the Colchian amphorae of the fabric 1 be done in the area of Borçka and from there sent to Batumi by boat?

Two main arguments are meeting to propose this hypothesis. On one hand, the published analyses of clay, which have been done on the raw material in the area of Murgul, show a concordance with the composition of the amphorae of the fabric 1 as described by Sergey Vnukov according to the analysis that he has conducted on the vessels. Indeed, the region is volcanic and the pyroxene is one of the components of the rocks.[17] After firing, the clay of the ceramics of Borçka takes a uniform reddish colour.

On the other hand, the river was navigable. The conveyance of the good through the Çoruh would be easy: the amphorae could be loaded on a boat in moorings on the river shore close by the workshops.

The brown clay amphorae -of the two fabrics- have been produced in huge quantity, especially between the 3rd-4th and the 6th-7th centuries. They can be divided into two morphological groups, which have succeeded to each other.[18] This intensity of production can

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11 We would like to thank the Prof. Shushana Putkaradze for this information.

12 For the typology of the Colchidian production since the beginning of the production until the first centuries of our era: Tsetskhladze and Vnukov 1992; Tsetskhladze and Vnukov 1993; Vnukov 2010. About the whole Colchian production: Vnukov 2011 and Opaiț 2015. See for a detailed study of the Colchian amphorae dated between the 1st century BC and the 2nd century AD in Vnukov 2003, pp. 160- 194 (variants Kh I A, B et C).

13 Vnukov 2010, pp. 30- 31; Vnukov 2011, pp. 271- 272. Opaiț 2015, pp. 289- 290 and p. 283 and n. 1 also attribute a part of the production to the area of Trabzon.

14 Vnukov 2011, p. 271.

15 Khalvashi 2002, pl. III, 1- 3; about the type that was produced: pl. I, 1 and pl. II, 1- 3.

16 Lomitashvili et Colvin 2010, pp. 36- 37, pl. 5, 1 and 2, kilns N 1 and N 2 (4th-6th century), pl. 20, 1 and pl. 21, 1 et 2. The 22 amphorae discovered in a single context and dated to the 6th century AD have most probably be manufactured in that site: *ibidem*, p. 37 et pl. 22, 1 et 2. They have a uniform colour, which corresponds to the fabric 1.

17 Akdoğan 2011, Summary.

18 They are classified respectively as a Transitional Variety and as the subvariant Ch ID in the typology of Vnukov 2011, p. 277, fig. 8.

be explained by the necessity of supplying the numerous Roman forts, which have been constructed around the Black Sea at that time. If we only look at the ones on the Western coast of Colchis, amphorae are present in Apsarus, Petra-Tsikhisdziri, Archaeopolis-Nokalakevi, Pitiunt, Dioskourias, Gudava. However, forts are also known on the southern coast: excavations have been done in Kurul Kaya and Cıngırt Kayası close to Ordu, where Colchian amphorae have been found.[19]

If this hypothesis is right, the amphorae would have been produced in Borçka and sent as a supply to the production of the area of Adjara and the central Colchis to answer to the high demand. Since no product was available in this area such as wine or oil to fill them, they should have come empty to Batumi to be filled there with wine before being redistributed by sea. The production of amphorae may have begun when Borçka and its region became Byzantine in the 6th century and continued until the end of the mass production at the end of the 6th century or the 7th century when the instability of the whole Black Sea would not allow any trading activity.[20] These amphorae would belong to the last Colchian type.

This hypothesis should be considered with all the necessary caution. Only some archaeological survey around Borçka and/or some clay analyses of the raw material of that area -clay and sand- may confirm it. It would solve partly the question if the Colchian amphorae were also manufactured in the south-eastern part of the Black Sea. This investigation should be extended to the coastal area of Trabzon to have a complete map of the production of the Colchian amphorae.

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[19] It is worth nothing that Colchian amphorae have been found in many sites on the other shores of Black Sea. They were also present in Mediterranean, but no study yet has shown the importance of the exportations in that direction.

[20] It also corresponds to the end of the production of amphorae in Sinope.

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Rezo Papuashvili, Nino Kobalia (Georgian National Museum)

Ancient Colchian Gold

The earliest golden items appear on the territory of eastern Georgia during the 3rd millennium BC, in the so-called Early Barrows Culture; they continued until the Middle Bronze age (mid-2nd millennium BC). After the period of the Trialeti Great Barrows Culture, almost no golden and silver items are found on the sites dated from the second half of the 2nd millennium to the beginning of the 1st millennium BC. Objects dating after this gap, during the 8th-6th centuries BC, have been discovered in various types of archaeological sites – in burial grounds and hoards, as well as in settlements. (The majority of these sites were excavated after the 1970`s when the Colchian Archaeological Expedition was established and formed under the leadership of T. Mikeladze. Before, only accidentally found hoards were known). These jewels are the models of the later, finest jewellery of Vani and Sairkhe.

According to Strabo (1.2.39), Colchis' wealth from gold, silver, iron and copper mines provided a fit reason for the voyage of the Argonauts and also for the earlier expedition of Phrixus. The scholars supposed that Argonauts' voyage to Colchis in the quest of the Golden Fleece had taken place at the end of the 2nd millennium or at the beginning of the 1st millennium BC. This is the time when Colchis is mentioned for the first time in Greek literary sources and Urartian cuneiform inscriptions.

The aim of our paper is to collect all the Colchian goldsmith pieces from the pre-classical period and analyze them chronologically. The oldest Colchian golden items were found in fourteen collective grave-pits of Tsaishi, Ergeta, Dgvaba and Ureki, at the settlement of Simagre and in the hoards of Nosiri, Partskanakanevi and Chuburkhinji. All these graves are dated according to the relative chronological scheme of the Late Bronze/Early Iron Age Colchian burials proposed by R. Papuashvili. They were arranged into four interchanging chronological groups. Most of them, they are dated to the first half of the 1st millennium BC. It also should be noted that all these sites are in the lower reaches of the rivers Enguri and Rioni.

Among the finds, there are different kinds of personal ornaments: beads, pendants, earrings, temple spirals, belts etc. Various techniques were used for the decoration: granulation, filigree, sheet gold and in-setting of stones.

The study of the Colchian graves containing this kind of findings is only in its initial stages. Many other sites (such as cemeteries of Tsaishi in Zugdidi region, Salkhino and Kurzu in Martvili region, settlement of Namarnu and Obergule in Abasha region, Kulevi etc.) are identified but still unexplored.

Hasmik Simonyan (Ministry of Culture of the Republic of Armenia)

Between the Rivers and over the Mountains. Comparative Analyses of the Diet among the Population of the Iron Age in Armenia

This paper presents the results of the odontopathological examination of the craniological collections extracted from different geological environments (Gegharkunik region and Ararat plain). Anthropological materials are dated back to the Early Iron Age and were extracted from collective and single burials.

The Gegharkunik region is located in Eastern Armenia; most of its territory is covered by the Lake Sevan, the largest lake in the Caucasus. The area has a mountainous landscape and all the excavated sites are lying at a height of 1900 meters above sea level, while the archaeological sites in the Ararat plain are not more than 900 meters above sea level. The region is divided into two sections by the Araxes River and only its northern part is located in Armenia. Most of the archaeological sites in the Ararat plain are concentrated near the river or its streams.

The Iron Age in Armenia is divided onto two periods: Iron Ia and Iron Ib that embrace the period from 1150 to 800 BC (Iron Ia: 1150-1000 BC and Iron I b: 1000-800 BC, Iron II: 800-650 BC). In terms of archaeological cultures, the Iron Ia corresponds to Lchashen-Metsamor 4 Culture, Iron Ib corresponds to Lchashen-Metsamor 5, Iron II corresponds to Urartian period.

The research project includes 5 palaeopathological features (abscess, caries, tooth loss, tooth wear and enamel hypoplasia), which have been observed only on the adult population.

The odonto-pathological situation depends on the geological environments: the high frequency of abscesses, weak manifestations and low percentage of caries, miserable existence of enamel hypoplasia characterize the rests in the Gegharkunik region, while the situation is completely different in the Ararat plain area, where high frequency of enamel hypoplasia led us to the following conclusions:

The enamel hypoplasia is considered to be an indicator of growth delays in the period of growth of the milk crowns and permanent teeth. Lack of calcium, phosphorus, vitamin D and some bacterial infections are considered to be wide-spread causes for that. Nutritional

stress is also the most possible cause for the emergence of enamel hypoplasia. Taking into consideration the fact that the enamel hypoplasia is one of the indicators of starvation, it may be suggested that the Early Iron Age population of the Gegharkunik region underwent frequent diet crises while the population of Ararat plain suffered of the lack of food.

One of the powerful factors favoring the emergence of caries is the presence of shugarose in the food, which severely affects dental tissues. Taking into account poor manifestation of caries in the Early Iron Age samples, it may be concluded that their diet was not rich with sugarose-containing cereals. On the other hand, fish from the lake Geghama (Sevan) rich in minerals prevented the tooth de-mineralization processes. Therefore, our observations suggest that caries might be a marker of the high social status. In the case of abscess, the situation looks more serious. The vast majority of the Early Iron Age population seemed to have suffered from abscess; in the Gegharkunik region, it was especially the male part of the population.

During the Early Iron Age, a common cultural space was established in the Armenian Highland. Within the common cultural space of Lchashen-Metsamor, a big growth of settlements and concentration of population in urban-type settlements took place. Bigger density of population created epidemiological risks and an increase of infectious diseases, as it appears from the numerous cases of abscess in the Early Iron Age population.

However, further studies may introduce some changes in the research results.

Farhad Guliyev, Valech Alakbarov

Traces of Anatolian Cultures according to the Recent Neolithic Investigations in Azerbaijan (On the Basis of Archaeological Sites of the Mid Kura Valley)

Archaeological research over the last few decades has shown that the first Neolithic societies developed as early as the 10th to 9th millennia B.C.E. in the Middle East, particularly on the southeastern flanks of the Anatolian Mountains and farther south. While the details of these initial phases of the Neolithization process need further clarification, current research is also being directed toward understanding the processes that took place in the neighboring regions and their relationship with the Neolithization processes in the Middle East. The issue most thoroughly studied was the dispersal towards west and Europe, whereas our understanding of when and how Neolithic societies emerged in the northern, eastern, and southern regions is less satisfactory. The South Caucasus represents such a region, with potential for more intensive investigations into these matters. Azerbaijan covers two main regions of Southern Caucasus, on the route to the Caspian Sea, along the Kura and Araxes rivers.

The Shomutepe-Shulaveri Neolithic culture.

Archaeological excavations conducted along the middle reaches of the Kura River in the South Caucasus revealed that the most ancient features of agriculture in this region appeared 8,000 years ago (in the 6^{th} millennium B.C.). Characteristic features of early farming cultures of Anatolia and the Middle East existed 11,000 years ago. The researches show clearly that the farming culture of the region was formed in close relationship with the cultures of Anatolia. But genetic studies are required to fully answer the questions of the biological origin of the earliest farmers in the South Caucasus; so far, no studies were undertaken in order to prove or deny it. However, it is possible to obtain some evidence about the cultural origins of this Neolitic phenomenon, through the archaeological evidence.

The first goals must be to securely define the cultural remains associated with subsistence records and to clarify the chronology of Neolithic settlements in the region. Research in the 1960s and 1970s revealed the existence of fully fledged agricultural settlements in the Southern Caucasus—notably, along the Araxes and the Kura Valleys. Excavations at sites such as Shomutepe and Shulaveris Gora led to the recovery of circular mudbrick buildings and typical Neolithic pottery (defined as the Shomutepe-Shulaveri culture), together with ground stones and domesticated plants and animals.

The Shomutepe-Shulaveri culture was named after the two eponymous sites excavated in the 1960s: Shomutepe in Azerbaijan and Shulaveris Gora in Georgia. Settlements assigned to this culture are densely distributed in the Middle Kura Valley, which is located mainly in Azerbaijan and southeastern Georgia. The architecture of these settlements is characterized by circular buildings ranging from 2 to 5 m in diameter. The buildings are connected by a curvilinear mudbrick wall, enclosing a circular courtyard. Hearths, bins, and other domestic features were found in the courtyard, which probably served as a daily activity space.

The material assemblages include all the items characteristic for the Neolithic: pottery; flaked, ground, and polished stone artifacts; bone tools; and domesticated plant and animal remains. Mineral-tempered pottery is reportedly more common in the earlier phase of the Shomutepe-Shulaveri culture, and plant-tempered pottery are more common in the later phase. Generally, Neolithic pottery of the Southern Caucasus, including Azerbaijan, starts from the beginning of the 6^{th} millennium B.C. Neolithic pottery assemblages have been divided into six groups according to the surface treatments and the presence/absence of decorations. These groups are: 1) Slipped, painted and polished ware; 2) Plain ware; 3) Wiped ware; 4) Applied decoration ware; 5) Bitumen painted and bitumen covered ware; 6) Impressed ware. The groups were established on the basis of the Göytepe excavations, where pottery was found in all levels at the site from the uppermost part to the 14^{th} level and showed all characteristic features of the Neolithic pottery in the region. Notably, the pottery assemblage included an imported Halafian painted fragment at the very early stage of Shomutepe-Shulaveri culture; this was found on Haci Elamxanli Tepe.

On the coeval Neolithic sites from the Near East, including Southeastern Anatolia, the pottery presents different forms; however, slipping and polishing treatments, the application of horizontal lugs (used as handles) on the exterior surface of the jars, the impressed decorations according to the type of patterns and positioning on the vessel were similar in the South Caucasus. Also, mat impressions under the vessels used for cooking are particularly similar. The archaeological sites along the Kura River showed traces of local production. But in subsequent stages, relationships were established between Anatolia and Southern Caucasus, with certain implications for the technological developments of the Southern Caucasus Neolithic pottery.

With regard to the lithic industry, the most characteristic tools are pressure-flaked blades made of obsidian that was procured mainly from sources in the Lesser Caucasus. Developments of the bone-tool industry are also characteristic of this cultural entity, as attested by a large variety of tool forms such as awls, hoes, hammers, spatulas, and picks. While the Shomutepe-Shulaveri culture was defined on the basis of archaeological records from the Middle Kura Valley, the distribution of comparable cultural assemblages is now known across a wider area. Instead of extending into the Lower Kura Valley, they occur in the Araxes Valley south of the Lesser Caucasus. The site of Kültepe Nakhichevan, excavated as early as 1951, already yielded similar architecture and materials.

The Neolithic sites of Göytepe and Hacı Elamxanlı Tepe

Göytepe and Hacı Elamxanlı Tepe are situated approximately 40 km east of Shomutepe (Western Azerbaijan). Göytepe represents one of the largest mounds known in the Middle Kura Valley, measuring approximately 145 m in diameter and 8 m in height. This mound was

identified as a Neolithic site during a survey in the 1960s and was confirmed through a stratigraphic section exposed by an Azerbaijani-French mission in 2006. From 2008 onward, it has been subjected to more extensive investigations by the Azerbaijani-Japanese mission. A large exposure consisting of 10 excavation squares measuring 10 × 10 m each has been made on top of the mound's northern slope. The single square 4B at the northeastern edge was excavated down to virgin soil. These operations revealed 11 m of Neolithic deposits consisting of 14 architectural levels, all of which are assignable to the Shomutepe-Shulaveri culture without any breaks in occupation. This impressive sequence is unparalleled at any other regional Neolithic site and provides us with the first opportunity to examine chronological developments of the Shomutepe-Shulaveri culture at a single locality over a long period of time.

At Hacı Elamxanlı Tepe, four 5 × 5 m squares were excavated down to the virgin soil, at a depth of 1.5 m. Four architectural levels have been defined. The architectural remains consist of circular mudbrick buildings similar to those of Göytepe, but their configuration is different: one small circular structure (ca. 3 m in diameter) abuts a larger one (ca. 5 m in diameter), making a snowman-shaped floor plan. This distinct architectural plan, recovered in all levels of Hacı Elamxanlı Tepe, has never been attested at Göytepe. However, the architectural data of Göytepe concern only the upper levels (levels 1–5), because current excavations of the lower levels are limited to an area too small to determine the complete architectural layout. Accordingly, future excavations of the lower levels of Göytepe might produce comparable architectural remains. In fact, this is quite likely considering that comparable "snowman-shaped" building complexes have been reported at Aruchlo, where occupations contemporaneous with the lower levels of Göytepe have been uncovered. Our excavations confirmed the rarity of pottery at Hacı Elamxanlı Tepe; only two dozen pieces were recovered from four occupation levels. The majority is plain mineral-tempered pottery resembling wares in the lowest levels of Göytepe. However, it is significant that the pottery assemblage included two pieces of fine painted ware reminiscent of Upper Mesopotamian traditions, such as Samarra and Early Halaf, whose paste and decoration patterns strongly suggest their origin in other remote regions.

The stratigraphic excavations and laboratory studies, including intensive radiocarbon dating of more than 50 samples, have allowed the documentation of many details regarding the earliest Neolithic cultural and economic development at these settlements, specifically between 5,950 and 5,450 BC. They demonstrate that the farming first appeared in the region around 8,000 years ago, in the immediate aftermath of the short, but significantly cold and dry, climatic event known as the 8.2 ka event. Farmers and the associated socio-economy seem to have been dispersed from the Middle East to the north after this climate shift, during a reorganization phase of the early regional society and its economy.

All these changes occurred in the mid-6th millennium BC. The close synchronicity of cultural developments in the Middle Kura and Araxes Valleys may well reflect substantial social interactions between these two regions. The identified cultural developments also strongly indicate that characteristics of the Shomutepe-Shulaveri culture were established gradually, as the result of local cultural evolution. But transmission phenomena from the Near East and especially Anatolia had profound implications for the Neolithization of the southern Caucasus. This interpretation is also corroborated by DNA analysis revealing transported livestock as well as by the archaeobotanic research on cultivated crops.

Ségolène de Pontbriand (AOROC CNRS-ENS Paris)

The Euphrates Valley: A Brilliant Cradle of Millenary Civilizations and a Secular War Zone / L'Euphrate : un brillant foyer de civilisations millénaires et une zone de guerre

This paper examines the history of the Upper and Middle Valley of the Euphrates from the foundation of the Seleucid Empire to the Conquest of the Arabs. It is a study of evolutionary historical geography based on the latest results of archaeological exploration along the valley, confronted with historical and philological sources. In this presentation, we will also discuss the trade and international exchanges that are most often at the origin of the development of the cities in the Euphrates valley.

After the ravages of the Assyrian and Babylonian epochs, the effects of which have been described in the Xenophon's *Anabasis*, the Euphrates Valley was an area to be repopulated and recivilized in the core of the Seleucid Empire. During the Hellenistic period, this region increasingly emerged as a cradle of civilization and exchanges, favorized by a remarkable urban development in parallel with the multiplication of crossing points from West to East and vice versa.

The conquest of the region by the Parthian Empire (around 100 BC) began to make the Euphrates a frontier zone. The cities that developed along the river witness the military and economic importance of the Euphrates. In spite of a few conflicts of various importance (defeat of Crassus, 53 BC), the area lives in a relative stability which, according to the archaeological and textual sources, allows its economic prosperity. At the same time, trade is developing along the river which becomes a major axis of circulation between the Mediterranean and the Indian world, the beginnings of which Isidorus of Charax gave us a precise description.

The Romans incorporated part of the valley in the Empire and thus reinforced the Euphrates border role. This does not prevent the great development of the "silk road", by navigation and by the roads of the Euphrates valley between Italy and the East. A part of which follows the Euphrates valley, the other part sees the development of caravan cities like Palmyra and Hatra. This period of prosperity suddenly ended with the final access to power of the Sasanid Shapur I in AD 228. For its misfortune, the Euphrates again becomes a zone of major conflict and a "boulevard" of the armies which again caused destructions and desolation until the Mediterranean side, but especially along the course of the river. Most of the great cities of the Euphrates were destroyed, some reborn from their ashes (Apamea-Zeugma), while others disappeared for ever (Europos-Dura).

This fatal period ends with the Arab conquest which definitely establishes peace in the valley. A new era of prosperity opens.

Jean-Claude Cheynet (University Paris IV-Sorbonne)

The Byzantine Euphrates: Real Border, Imaginary Border / L'Euphrate byzantin : frontière réelle, frontière imaginaire

Short English abstract: The Byzantine Empire inherited its eastern border from the classical Roman Empire. The Euphrates played a major role in the Persian Empire, forming the backbone of the network of fortresses built on both sides of the river. The triumph of the Muslim Arabs abolished this frontier, but as soon as the Byzantine Empire regained some strength, the imperial armies raided the Euphrates. From the end of the ninth century onwards,

the reconquest set itself the objective of restoring the Euphrates as the frontier of the Empire, as the river that separated Romanity from barbarism. The fighting was carried out by the local populations of the Acritic provinces of the frontier, led by the great aristocratic Anatolian families. It was in this context that the first acritic songs developed. In the first half of the eleventh century, Byzantine expansion resulted in giving back to the Empire what contemporary people regarded as its traditional, natural frontiers, the Danube in the West and the Euphrates in the East.

At the end of the eleventh century, the new Muslim invasion led by the Turks once again rolled back the empire away from the Euphrates, on the outskirts of which a series of principalities was established, largely with an Armenian component. Under the Comnenian dynasty, John II and Manuel again led armies near the Euphrates, without any concrete results. The nostalgia of the Eastern aristocracy, which had largely fled to the court of Constantinople, favored the emergence of epic poems around the Digenis Akritas, the hero of the double race, Roman and Saracen, who created a magnificent garden and built a sumptuous palace where the mosaics evoked the heroes of the Old Testament or the exploits of the Greeks before Troy or the triumphs of Alexander the Great against the Persians. The Byzantines saw in it a lost paradise.

Extended French paper: L'Euphrate forme avec le Tigre l'un des quatre fleuves du Paradis dont l'identification ne faisait pas difficulté pour les chrétiens d'Orient, qui le voyaient de leurs propres yeux. C'était un fleuve impressionnant qui connaissait des crues de grande ampleur et dont le cours d'eau était toujours puissant. Michel Psellos décrivant une réception d'ambassadeurs par Isaac Comnène (1057-1059) compare son flot de paroles à l'Euphrate bouillonnant. Le fleuve fut un marqueur de la frontière de l'Empire romain face à l'Empire perse. Cette frontière ne fut jamais franchie durablement par l'un au l'autre Empire, le règne de Trajan faisant exception. L'Empire romain d'Orient, successeur sans discontinuité de l'Empire romain, hérita de ce fleuve frontière. L'Euphrate redevenait la frontière avec la Perse ou l'Arménie sous influence perse, lorsque la situation tournait au désavantage des Romains, comme après la défaite de Valérien.

Lorsque Justinien réorganisa les provinces d'Arménie, les provinces en deçà de l'Euphrate et celles au-delà n'avaient pas le même régime administratif. Les premières relevaient de l'autorité directe du basileus qui y envoyait des gouverneurs comme dans le reste de l'Empire, alors que les nobles arméniens dans les provinces à l'Est gardaient leur autonomie. Lorsque l'empereur décida d'harmoniser le statut de ces provinces il en résulta des troubles importants.

L'Euphrate resta un enjeu majeur des guerres avec la Perse au temps de Justinien et d'Héraclius. Les Byzantins se trouvèrent en position défensive sur la frontière orientale, lorsque l'empereur Justinien entreprit la reconquête d'une partie de l'Occident et lorsque Héraclius fut confronté à la pression des Avars et de leurs alliés slaves dans les Balkans. Cette posture défensive s'est appuyée sur la construction d'une ligne de forteresses, dont la principale était Dara. Ces forteresses étaient situées pour une part en avant de l'Euphrate qui formait un dernier obstacle à l'avancée de l'ennemi.

Lorsque commença la dernière guerre avec les Perses, la ligne de l'Euphrate ne fut percée qu'après plusieurs années d'effort des assaillants, qui profitèrent de la guerre civile qui opposa les partisans de Phocas à ceux d'Héraclius, son successeur. Héraclius, d'abord vaincu, vit les provinces d'Orient perdues et la ligne défensive de l'Euphrate submergée. Lorsque Héraclius triompha, il se contenta de rétablir la frontière au temps de l'empereur Maurice, dans sa plus grande extension territoriale après que cet empereur eut rétabli Chosroès II sur son trône.

La conquête arabe annula tous ces gains de manière définitive, car la Mésopotamie byzantine ne put être défendue et l'Arménie elle-même accepta rapidement l'influence des Arabo-musulmans avant de passer sous leur domination directe. Le cours de l'Euphrate ne traversait plus l'Empire byzantin pour près de trois siècles.

Les premières contre-attaques des armées byzantines les ramenèrent dans des régions proches de l'Euphrate, autour de Samosate, l'une des villes les plus accessibles parmi celles qui bordaient le fleuve. Dès le règne de Tibère Apsimar (698-705), les Byzantins firent un énorme butin avant de se replier rapidement sans perte. Constantin V mena ses armées jusqu'à Germanicée/Marash et Théophile les conduisit jusqu'à Sôzopétra, mais sans franchir le fleuve. Peu après Basile I^{er}, combattant la secte des Pauliciens, se dirige vers leur place forte, Téphrikè, voisine de l'Euphrate, puis descendant vers le sud, guerroie autour de Samosate et envoie un corps de cavalerie d'élite au-delà du fleuve. Ce raid fut victorieux, mais l'empereur s'était, dans un premier temps, prudemment abstenu de traverser le fleuve. Cependant, encouragé par ce succès, l'empereur mit un point d'honneur à construire un pont sur le fleuve qu'on ne pouvait passer à gué, car il était en crue. C'est l'occasion pour l'auteur de la Vita *Basilii*, son petit-fils l'empereur Constantin VII Porphyrogénète, de mettre en valeur la force physique de son ancêtre et sa simplicité, car Basile participait avec les soldats à la construction de l'ouvrage. Basile, soucieux de légitimer un pouvoir obtenu par la violence, exploita cette expédition en s'octroyant un triomphe à Constantinople.

Ce fut la seule incursion impériale avant Nicéphore Phocas, mais désormais la région du moyen Euphrate, qui incluait l'émirat de Mélitène, ainsi que celle de l'Arsanias, l'une des rivières formant l'Euphrate, furent la cible des généraux byzantins qui ne se contentèrent plus de raids de pillage, mais conduisirent la reconquête au cours des IX^{e} et X^{e} siècles. Ces stratèges de thème s'illustrèrent contre les Arabes des émirats, Mélitène, Tarse, et Alep. Ces combats forgèrent l'aristocratie anatolienne qui domina l'empire au X^{e} siècle, les Phocas, les Doukai, les Argyroi, les Sklèroi, les Diogénai, etc. A la frontière, redevenue mobile, les aventuriers des deux camps se taillent des territoires semi-indépendants.

Il est remarquable que les chants acritiques, qui vantent la bravoure héroïque des guerriers des frontières, soient attestés pour la première fois par Aréthas de Césarée, contemporain de Léon VI et mort vers 932. Nous ne les avons pas conservés, car nous ne disposons que de l'épopée de Digénis Akritas, dont nous verrons que la date de rédaction est plus tardive.

Les armées byzantines, sous l'impulsion des domestiques des Scholes, Jean Kourkouas, Bardas et Nicéphore Phocas, continuèrent d'avancer vers l'Euphrate lorsqu'elles conquirent définitivement Mélitène, en 934, dévastant une nouvelle fois Samosate. Désormais l'Euphrate est le fleuve de la confrontation, lorsque les Byzantins le franchissent pour aller ravager de plus en plus profondément le pays ennemi. Un Arménien, Mélias, venu à la tête d'une bande de guerriers, réussit à agrandir la clisure, puis le thème de Lykandos, acquérant une réputation de grand guerrier. Cette poussée byzantine aboutit à la reconquête de Théodosioupolis. Au cours du X^{e} siècle, après la chute de Mélitène, le fleuve marque la création et l'expansion du thème du Lykandos, la nouvelle frontière au nord-est de l'Empire.

Cette avancée entraîna une vive réaction des musulmans qui se traduisit par l'afflux de volontaires du djihad qui vinrent augmenter les effectifs de l'émir Hamdanide, Sayf ed-dawla, qui sembla un temps capable de se mesurer aux armées byzantines commandées par les généraux de la famille Phocas. Durant la seconde moitié du X^{e} siècle, les principales offensives passaient par les défilés du sud du Taurus. Mais l'Euphrate est à nouveau pris à témoin pour les exploits des uns et des autres. Un des poètes de la cour de l'émir hamdanide, al-Motanabbi, évoque cet assauts des cavaliers arabes : « ils frappèrent d'effroi l'Euphrate qui crut voir déferler sur lui des torrents d'hommes. Chaque coursier y pourchassait les vagues, insoucieux du flot, comme en un fleuve à sec ». L'impétuosité des cavaliers abolit en quelque

sorte le fleuve. Les poèmes arabes ripostent aux chants acritiques par l'évocation, en des termes sans doute identiques, des prouesses des combattants de part et d'autre du fleuve, créant une commune mentalité pour tous les habitants des régions frontières

L'Euphrate influence l'issue des opérations militaires. En 958, une crue de l'Euphrate interdit le passage à l'armée du parakoimomène Basile Lécapène. Celui-ci, ainsi détourné de son premier objectif, vint mettre le siège devant Samosate qu'il prit en une journée. Les nombreux combats, autour de Samosate et d'Asmosate, plus au nord, finirent par tourner à l'avantage des Byzantins ; ils s'emparèrent de ces villes et constituèrent le thème des villes pareuphratiques. Sous Basile II, c'est un autre grand fleuve, le Danube, qui redevient la frontière de l'Empire dans les Balkans, et le thème du Paradounabon est créé. Dans les deux cas, le fleuve sert de référence à la nouvelle circonscription administrative. Aux X^e^ et XI^e^ siècles, les deux fleuves Danube et Euphrate constituent les frontières naturelles de l'Empire. Lorsque les tacticiens byzantins exposent les méthodes de franchissement d'un fleuve, ils prennent en référence le Danube et l'Euphrate.

A partir de la seconde moitié du X^e^ siècle, le haut Euphrate est contrôlé par les Byzantins. Le thème de Mésopotamie est créé au début du X^e^ siècle et couvre un territoire situé entre le fleuve et son principal affluent du nord, l'Arsanias. Il comprend le pays de Cemishkezek, localité d'origine, comme son nom l'indique, de Jean Tzimiskès. Ce thème était particulier, car son stratège, comme celui de Chaldée, recevait comme traitement tout le *kommerkion* levé dans son thème. Ces droits de douane étaient prélevés, on le supposera, aux points les plus faciles à contrôler, ceux où la traversée de l'Euphrate était possible. Ce mode de paiement n'était pas une innovation, puisqu'il reprenait les instructions d'un édit d'Anastase.

Les frontières de l'Empire furent à nouveau portées au-delà de l'Euphrate, comme au VI^e^ siècle. Georges Maniakès, le stratège du thème des villes pareuphratiques, profita d'une querelle entre émirs et annexa en 1032 la ville d'Edesse alors que, dix ans plus tôt, Basile II s'était fait offrir le royaume du Vaspourakan. Cette expansion est due à des opportunités plus qu'à un projet organisé de nouvelles conquêtes. L'Euphrate est considéré comme la frontière entre la romanité et les barbares. C'est ainsi que s'exprime Jean Mauropous, principal conseiller de l'empereur Constantin Monomaque, lorsqu'il compose un long discours relatant la victoire de l'empereur sur un rebelle, Léon Tornikios. Mauropous rappelle que, lorsque ce dernier prit les armes contre le *basileus*, au printemps 1047, les armées byzantines étaient occupées à guerroyer, au-delà des frontières, au-delà de l'Euphrate, contre les « barbares de Dvin », en Arménie.

Pour les Byzantins du XI^e^ siècle, en effet, les peuples qui résident à l'est de l'Euphrate sont des barbares, même si Byzance domine Ani, Charpout, Edesse… Ce sentiment est perceptible même dans des textes qui ne commentent pas la situation en Orient, mais qui révèlent l'*opinio communis* à la cour de Constantinople. Ainsi, dans l'oraison funèbre du patriarche Michel Cérulaire, Michel Psellos évoque la perte douloureuse de son frère, qui s'était suicidé, à la suite de l'échec d'un complot contre l'empereur Michel IV : « si un Scythe d'au-delà de l'Istre perd cinquante fils, je ne l'estime pas pour autant victime d'un terrible malheur ; si un Perse d'au-delà de l'Euphrate voit sa terre ravagée, les êtres qui lui sont le plus chers faits prisonniers, je ne dirai pas pour autant qu'il est accablé de douleur et victime d'un sort cruel. Au premier en effet la nature a procuré sans qu'ils fassent rien pour cela la sagesse des Scythes, à l'autre l'habitude du malheur adoucit son infortune. »

Isaac Comnène, le premier empereur militaire depuis Basile II, considérait que des conquêtes supplémentaires en Orient ne renforceraient pas l'Empire, car le *basileus* dominerait des populations qui ne partageaient pas les traditions romaines et ne seraient soumises qu'au prix d'une occupation militaire. Il n'était pas question d'aller davantage au-

delà de l'Euphrate, ni, plus au sud, d'augmenter le duché d'Antioche par des annexions plus à l'Est, notamment en s'emparant d'Alep.

Cependant cette époque de paix relative prit fin avec de nouvelles invasions, Normands en Italie, Petchénègues dans les Balkans et Turcs en Anatolie. Psellos résume admirablement la confusion qui prédomina dans les provinces frontalières où se mêlent les races, créant des mixobarbares, catégorie qui apparaît à cette date dans le vocabulaire politique byzantin : « Il semble ... que les plaines et les collines du territoire romain étaient cachées comme par des voiles. Certains étaient naturels, les précipices, les montagnes et les fleuves, les autres construits de main d'homme, les villes et les forteresses. Le barbare qui poussait son cheval jusqu'à ces obstacles, à leur vue, retenait sa monture et n'osait pénétrer. C'était comme une digue qui leur fermait l'accès à la forteresse. Lorsqu'une telle digue s'est rompue, toute la partie adverse s'est engouffrée chez nous, comme les flots d'un fleuve jusque-là canalisé. Maintenant rien ne sépare le pays romain du pays barbare, mais tout semble mêlé et les gens vivent dans la confusion des races. C'est pour cela qu'ils luttent avec nous, tantôt par une guerre sur l'Euphrate, tantôt par une autre sur l'Istre. »

De nouveau l'Euphrate est au cœur du conflit, car le fleuve, qui était largement sous contrôle byzantin avec la conquête des terres arméniennes, se laisse traverser par les Turcs nomades qui parcourent le cœur de l'Anatolie. Matthieu d'Edesse rapporte plusieurs batailles perdues par les Byzantins sur les bords du fleuve, dont les généraux byzantins espéraient qu'il redeviendrait un obstacle pour les envahisseurs. C'est au bord de ses rives que l'empereur Romain Diogène laisse l'un de ses meilleurs généraux, Philarète Brachamios, qui, cependant, se fit battre par les Turcs près de Mélitène. Lors d'un conseil de guerre, le même empereur demanda leur avis aux généraux de son armée sur la stratégie à observer face aux Seldjoukides. Ceux-ci se divisèrent, et une partie d'entre eux fut d'avis de se replier sur les vieux thèmes romains, donc en deçà de l'Euphrate et d'abandonner les Arménika thémata, c'est-à-dire, entre autres, tous les petits thèmes parcourus par l'Euphrate. Il s'agissait bien d'un point de vue militaire, mais il suppose que le sentiment de loyauté naturelle à l'égard du *basileus* s'estompait au fur et à mesure qu'on allait vers l'Est.

Nous sommes très mal informés sur le mouvement des différentes tribus turques dans les décennies 1070-1090. Comme la frontière resta tenue jusque vers 1085 par Philarète Brachamios et les ducs qui lui étaient subordonnés, il faut supposer que le gros de la pénétration turque se fit par les provinces du haut Euphrate, vers Théodosioupolis, Sébasté, Harput…

On aurait pu penser que l'Euphrate avait définitivement quitté l'imaginaire byzantin, avec l'occupation irréversible de l'Anatolie centrale par les Seldjoukides. De fait, dans toute l'*Alexiade* qui relate les hauts faits de l'empereur Alexis Comnène, il n'y a qu'une référence au fleuve, lorsque Anne Comnène prétend que si son père n'avait été empêché par les guerres ininterrompues, il aurait totalement rétabli la puissance romaine, mais qu'il a tout de même redonné comme limites l'Adriatique en Occident et le Tigre et l'Euphrate en Orient, alors qu'au moment où Anne place ce commentaire, vers 1087, l'Empire était, dit-elle, borné par le Bosphore en Orient et Andrinople du côté des Balkans. La prétention d'avoir replacé la frontière romaine sur les fleuves mésopotamiens est évidemment excessive, sauf si l'on considère que le traité de Déabolis, en 1108, avait été appliqué. Il donnait en effet à Bohémond, prince latin d'Antioche, une partie des anciens thèmes proches de l'Euphrate, à charge pour lui de les reconquérir.

Pourtant, dès que des perspectives de reconquête se firent jour, l'Euphrate redevient un objectif qui donne la preuve que la puissance de l'Empire est restaurée. Le territoire de l'Empire ne jouxte plus le fleuve dont il est séparé par les Danishmendides au nord, les Seldjoukides au centre et les Etats francs de Terre sainte au sud. Jean II Comnène fut le premier *basileus* à s'aventurer dans ces régions depuis Romain Diogène, lorsque, au cours de

sa grande campagne contre les Latins d'Antioche, des éléments de l'armée byzantine atteignirent le fleuve. La propagande impériale tira parti de ses chevauchées vers l'Est, comme en témoignent les éloges prodigués par le poète de cour Théodore Prodrome, qui loue le basileus d'avoir ramené la cavalerie byzantine sur les rives du fleuve, et les orateurs qui, systématiquement, mentionnent l'exploit dans leurs discours prononcés au palais à Constantinople. Dans un de ses poèmes, Prodrome déclare que c'est l'Euphrate qui a peur de l'empereur, ce qui manifeste indirectement qu'il n'est plus un fleuve romain, mais qu'il est habité par des ennemis de l'Empire. Cependant, dans son discours d'adieu à l'armée, alors qu'il est aux portes de la mort en 1043 et va confier le pouvoir à son cadet, Manuel, il rappelle qu'il n'a pas atteint tous ses objectifs dont l'un était de se baigner sans crainte dans l'Euphrate et de voir le Tigre en terrifiant l'ennemi.

Manuel Comnène reprit la politique paternelle en renouant avec des grandes expéditions vers Antioche, mais ne paraît pas avoir dirigé ses troupes vers l'Euphrate, Mélitène étant dans les mains des Seldjoukides. Il espérait faire du sultan un subordonné volontaire, un *doulos* de l'empereur. Toutefois au début de son règne, le comté d'Edesse succomba sous les coups de Zengui, qui prit la ville en 1144. Vers 1151, Manuel, après des négociations avec Béatrix, comtesse d'Edesse, récupéra une série de forteresses le long de l'Euphrate. Les garnisons mises en place ne purent résister aux assauts de Nur ed-din, ce qui mit fin à la présence byzantine sur l'Euphrate. Les chroniqueurs byzantins passent sous silence cet épisode finalement peu glorieux pour Manuel.

Après le règne de Manuel Comnène, l'incapacité de l'Empire à s'emparer du plateau anatolien, sanctionnée par la défaite de Myrioképhalon en 1176 et l'indépendance de la Cilicie arménienne, interdirent de songer à retrouver les anciennes frontières de l'Empire. Nicétas Chôniatès se moque de l'empereur Isaac II Ange (1185-1195) qui, sous l'influence des devins, songeait qu'il retrouverait la puissance des anciens *basileis*, poursuivrait et massacrerait les Ismaelites au-delà de l'Euphrate, rêve désormais chimérique.

C'est dans ce contexte qu'il faut comprendre l'élaboration des chants acritiques, évoqués déjà au IX^e^ siècle, sous la forme d'une épopée, celle de Digénis Akritas, l'homme de la frontière, à la double race, romaine et sarrasine. Plusieurs versions du texte existent, conservées dans deux manuscrits principaux, ceux de l'Escorial et de Grottaferrata. Les savants se disputent pour savoir quelle est la version la plus ancienne, sans résultat incontestable.

Il reste peut-être des traces plus anciennes des chansons acritiques des IX^e^ et X^e^ siècles, détachées du corpus qui fournit la matière du Digénis Akritas, comme le *Chant d'Armouris*. Henri Grégoire a le premier souligné l'importance de ce poème de deux cents vers environ, que Paolo Odorico a, plus récemment, traduit et commenté. Ce poème évoque le fils d'un stratège captif des Arabes, Armouris, qui dès son plus jeune âge, fait preuve d'une bravoure et d'une force exceptionnelle, en défiant les Sarrasins innombrables, regroupés de l'autre côté de l'Euphrate. L'un des passages marquants du poème oppose le jeune héros, monté sur le cheval de son père, à un Sarrasin qui le raille parce que les chevaux des siens, rapides, ne passent point l'Euphrate, alors que le jeune homme qui n'a pas trouvé de gué veut le franchir avec sa vieille monture. Le fils d'Armouris, mis au défi, d'un coup d'éperon traverse à la nage le fleuve aux flots profonds qui ont débordé. Une voie angélique l'a conseillé pour cette traversée miraculeuse. Il est désormais en terre ennemie où il va multiplier les exploits, mais le premier d'entre eux est bien le franchissement du fleuve.

Le récit du *Digénis* est beaucoup plus élaboré. La date à laquelle a pris forme le corpus tel que nous le connaissons a fait l'objet de discussions, mais les savants, à la suite de N. Oikonomidès, s'accordent à penser que ce n'est pas au moment où l'épopée est censée se dérouler, mais beaucoup plus tard, au XII^e^ siècle. Pour Oikonomidès, le premier chant, celui de l'émir, le père de Digénis, qui est nettement distinct du reste le l'épopée, pourrait être

antérieur et remonter au X^e^ siècle. P. Magdalino penche pour le règne d'Alexis Comnène qui connaît une vraie nostalgie de l'Orient si récemment perdu. Toute une partie de l'aristocratie micrasiatique est réfugiée à Constantinople ou dans les Balkans et attend que l'empereur s'engage dans la reconquête. Le *Digénis* restitue un paysage géographique des confins orientaux de l'Empire et d'une société des frontières. Depuis Henri Grégoire, les savants se sont efforcés d'identifier les principaux personnages du Digénis. On y retrouve les Doukai qui, sous les Comnènes, occupent encore une place d'exception dans la société du temps, puisque Jean II Comnène est un Doukas par sa mère.

La version de l'Escorial du *Digénis* décrit avec soin le palais du héros. Après avoir assuré la sécurité de la région par ses nombreuses victoires sur les émirs, il décide de construire sa demeure dans la plaine, ce qui suggère une résidence antérieure dans des lieux escarpés. Il choisit le bord de l'Euphrate pour y aménager un jardin magnifique en détournant les eaux du fleuve, y installant des viviers. C'est une imitation du Paradis, dont il partage ainsi l'un des fleuves. Son palais « était vraiment splendide, bien plus que tous les autres, bien plus que celui du roi de la terre des Persans ». Il fit également bâtir un pont à une seule arche qui permettent l'accès aux deux rives du fleuve. La version de Grottaferrata reprend ce chant, en précisant les sujets des mosaïques à fond d'or du palais. Trois thèmes prédominent : les exploits des héros de l'Ancien Testament, Samson et David, qui luttèrent victorieusement contre les Philistins, ceux des héros grecs d'Homère et pour finir ceux d'Alexandre, inspirés non de l'histoire du conquérant, mais d'une version du *Roman d'Alexandre*. Il y ajouta un sanctuaire dédié à saint Théodore.

Ces passages du *Digénis* sont révélateurs des qualités que l'on prêtait à l'homme à la double race et du rôle symbolique de l'Euphrate. Lorsque la paix revient, le fleuve n'est plus une frontière mais un passage entre les deux mondes, celui de la Romanie, et celui des « Perses », qu'ils soient Arabes ou Turcs. Les thèmes du *Digénis* sont particulièrement bien adaptés à un public qui rêve de retrouver les provinces d'Orient et sait que la région de l'Euphrate avait abrité après l'invasion turque et la première croisade un nombre important de principautés arméniennes appuyées sur des forteresses proches du fleuve. Les poètes auteurs du *Digénis*, des Constantinopolitains à n'en pas douter, n'ignoraient pas l'esprit d'indépendance des seigneurs locaux et la diversité ethnique de ces principautés autonomes. Ils exaltaient le temps où les ennemis musulmans étaient humiliés, mais en même temps, comme cela a été remarqué, les Sarrasins sont assez peu présents et ne sont pas maltraités à l'excès par les poètes. Les empereurs byzantins cherchent aussi à assimiler les peuples soumis ou les envahisseurs. Manuel Comnène se heurta au patriarche pour accepter facilement les musulmans convertis au sein de l'Empire sans exiger d'eux de blasphémer contre Mahomet. Il est aussi l'empereur qui mena la politique orientale la plus audacieuse et se laissa qualifier par Théodore Prodrome de nouveau Digénis.

Le *Roman d'Alexandre* connut une grande diffusion à Byzance où plusieurs versions circulèrent. La version ε aurait été composée au VIII^e^ ou au IX^e^ siècle, Alexandre empruntant les traits et les manières de l'empereur byzantin. Lorsque Alexandre eut conquis l'Asie Mineure et l'Egypte, en gros ce qui deviendra l'Empire romain d'Orient, il se dirigea à nouveau contre Darius pour la bataille décisive qui lui donnera le contrôle de la Perse. Darius s'est installé dans la plaine du Tigre, près d'Arbèles, en 331 avant JC. Pour l'affronter, Alexandre doit traverser l'Euphrate. A nouveau le fleuve est présenté comme un obstacle redoutable. Le roi macédonien fait construire un pont pour faire passer l'armée et les chariots d'équipement et de ravitaillement. Les soldats étant effrayés par le courant du fleuve, Alexandre passa le premier et toute l'armée le suivit. Puis il fit détruire le pont pour que nul ne songe à s'enfuir face à l'immense armée perse. Dans cet épisode, l'Euphrate symbolise l'entrée au cœur du territoire ennemi, où l'on ne rencontre plus de population grecque et où

l'armée ne pourra survivre que victorieuse. Les Byzantins se reconnaissaient dans ce récit, qui reflétait leur propre situation.

L'Euphrate fut donc constamment considéré comme la vraie limite traditionnelle du monde romain face à l'Orient « barbare », mais dont le souverain majeur est aussi reconnu comme l'égal du *basileus*, que ce soit le shah perse ou le calife musulman. C'est aussi, à certaines époques, une zone tampon entre les deux puissances, au IX^e^ siècle et dans la première moitié du X^e^ siècle et à la fin du XI^e^ siècle et au début du suivant, où se nouent et se dénouent des alliances de circonstance. Lorsqu'une puissance prédomine, elle reporte sa frontière à l'Euphrate, voire un peu au-delà, comme Byzance entre 950 et 1070.

Les populations qui habitent les rives du fleuve se combattent souvent pour le compte des Empires et leur enrichissement propre. Ce fut le cadre idéal pour l'exaltation des héros, la traversée de l'Euphrate n'étant pas le moindre des exploits. Ces combats où s'illustrèrent les grandes familles anatoliennes donnèrent naissance aux chants acritiques, au moment même où la dynastie macédonienne s'enracinait. Ces textes furent aménagés en une épopée, sous plusieurs recensions, par quelques poètes du temps des Comnènes, époque de nostalgie de la grandeur macédonienne, alors que l'Euphrate n'était plus atteint que fugitivement, avant d'être définitivement perdu.

Martine Assénat (University of Montpellier, France – CRISES)

Amida ad Tigrem (Diyarbakır – Turkey)

Although the *ad Tigrem* position recorded by the Peutinger Table has not been precisely identified, the road map does situate it on the Melitene-Tigris section, meaning on the ancient road – the Persian Royal Road which, under the Achaemenid Empire, travelled from Persia to the Aegean Sea (Briant, 1996: 378 – Assénat et Pérez, 2012: 22-23), or "from the sea to the King", to borrow the famous words of Herodotus (V, 49-53). For this reason, the term could include the Amida stage, whose name is strangely absent from the map (Barrington 2000: 89) (fig.1).

Nevertheless, Amida is situated *ad Tigrem*, "at the Tigris"; hence my contribution, stemming from the study of the site, deals with the topic of Anatolian rivers and, more precisely herein, of a Mesopotamium river.

Preparatory research investigations, at Amida started in the frame of the application to UNESCO for the patrimonial recognition of the Diyarbakır wall and the gardens of Hevsel. In this basic framework we performed a multi-disciplinary study[21] on the relationships between the City and its environment, and more specifically between the City, the Tigris and the meander of the Gardens of Hevsel.

These three objects of research – at once distinct and complementary – have always been closely co-related through the circulation of people, of materials and natural elements. In such an integrated system each location and each element position at this location must be considered as both a departure point and as an end destination. (fig.2)

Within the scope of our reflection on classical Antiquity and its Byzantine extensions, we shall be investigating the general economy of their relationship, focusing on their

[21] This site is the focus of a multi-disciplinary research programme whose object is specifically to study its human and environmental history. See joint publication: *Les Jardins de l'Hevsel à Amida/Diyarbakır. Etudes et Réhabilitation de jardins mésopotamiens Patrimoines au Présent, Revue de l'IFEA. (collectif dir. M. Assénat) https://books.openedition.org/ifeagd/1226.* This programme was supported by Envimed/Mistrals (MAE-CNRS), by the IFEA, by the laboratory CRISES (University of Montpellier 3), and by the MSH-Sud of Montpellier.

topographical, political, and economic aspects.

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At the Diyarbakır (Amida) location, the river has always had a key role in sculpting the landscape dominated by the city. Through time, the Tigris bed has been gradually both incising and withdrawing from the foot of the basaltic cliffs toward the south-east. The edge of the basaltic plateau thus became a promontory over the deepening valley. The river withdrawing occurred at the expense of the soft rocks overlain by the basalts. These soft rocks are composed of lake and lake-related clastic sediments of several tens of meters (ie. Easily eroded) called the "Selmo Formation". Differential erosion led the course of the Tigris to flow parallel to the lineation of the basaltic flow. South, however, the Tigris River bed is constrained in a canyon incising the basaltic flow. The factor triggering this incision must have been a tectonic (or "volcano-tectonic") uplift, in addition to climatic forcing (Westaway *et al*. 2006 - 2007; Bridgland et al. 2008). This uplift occurred during the Pleistocene, after the magnetic activity of the Karacadağ emitted the two lava flows dated to 1.22 ± 0.02 and 1.07 ± 0.03 Ma, which overlie Early Pleistocene Palaeo-Tigris graved at very similar levels below the Diyarbakır City and on the overside of the canyon at 70 m above the present river.

The river adapted to the "dam" effect produced upstream the canyon, by developing a meander inside the soft Selmo Formation. With time, alluvial deposition/erosion cycles caused the formation of embedded terraces, formed step by step more or less regular (Kuzucuoğlu and Karadoğan 2015). The magnitude differences in the scarps from top to bottom of the step-disposed terraces (the highest steps are at the top of the sequence) points to (1) the decreasing impact of uplift, and (2) the increasing role of climate-controlled hydrological factors in the formation of the terraces (Bridgland and Westaway, 2008). The regular yougering of the sediments from the bottom of the City walls today's river flood also show that once the river abandoned a terrace, it did not flow back over it. Meaning that, once a terrace on the right bank of the river could be exploited for agricultural production, the river did not destroy it afterwards except, possibly, at both extremities of the meander (Kuzucuoğlu pers. com.). The river may, however, have deposited fertile silts on the top of the lowest terrace(s) at times of seasonal floods (at springtime).

These alluvial deposits now form the highly fertile territory knew as the Gardens of Hevsel (Karadoğan, 2016). The basaltic plateau, with its cliffs overlooking the valley, is formed of one or two lava flows (close in age: Westanay et al. 2006) from the Karacadağ volcano, which overlay (and baked) an older pebble deposit topping the Selmo Formation. These flows possess tunnels due to speed differences between the surface and the bottom layers of the lava flows. Rainfall penetrates fissures in the lava, flows into the tunnels, and discharges as abundant springs at the contacts between the lava bases and the impermeable Selmo clay layers, to flow out as abundant springs. These springs ensure the gravitational irrigation of the Gardens of Hevsel, which correspond to ca. 400 hectares of rich alluvial soil.

The city as it stands today, with its spectacular walls, displays the main features of Constance (fig.3). It was built on the site of a protohistoric *höyük* that dominates the landscape (Ökse, 2015), and stretches over 156.4 hectares towards the North-West along the plateau. Our conclusions, however, show that it is in the part closest to the river, along the cliffs forged by the Tigris, that an initial Roman city was formed. The analysis of the city plan reveals that this first settlement, no doubt already fortified and located in the eastern part of the site, underwent, during the era of Constance, a substantial extension towards the West, as its surface area practically doubled during that time (Assénat et Pérez, 2014). These urban dynamics lead us to make the association with Ammianus' mention (XVIII, IX, 1) – *"This city*

was once small; but Constantius, still Caesar at that time (Caesar etiam tum), wishing to provide an absolutely safe refuge for the neighbouring inhabitants, encircled it with powerful towers and walls… – while nevertheless re-establishing the presence of a city that was not as small as the rhetoric of the historian of Antioche might lead us to believe (Assénat et Pérez: 2014) (fig.4). We know nothing of the hold of the possible Seleucid colony, (Assénat et Pérez, 2013), no more than that of the Amedu mentioned in Assyrian royal Annals in the 9th century BC[22]. We may note here the longevity of the city's name.

From Roman Antiquity, the relationship between the city, the river and its meander has been inscribed in the urban topography, both by the construction of the wall and by the main travel routes that it forged between the two. Similarly, its construction left an imprint on its environment, of which certain aspects remain visible.

To the East and the South of the site, the city walls hug the contour of the basaltic cliffs. The builders took advantage of the relief to raise the construction even higher. The erection of the wall – which structures the landscape and represents the site's relationship with its environment – took best advantage of the cliff that afforded natural height, and from which the stone for its construction was quarried. On site, we observed that features formed by the basaltic flow were used selectively in the wall's construction: the big blocks formed its base and the outer facing, the smaller ones formed the upper sections and the inner facing (Assénat et Bessac, 2015). In certain places, artificial terraces were formed by removing the basaltic rock. Our study of the ancient quarry works of the Hevsel meander looks at the ecological, economic and social impact that the construction of such a monument must have had, and also that of its reconstruction and extension, both locally and regionally. Basaltic blocks and were excavated from this environment, as was the clay used to make the many bricks employed in particular in the tower vaulting, while sand from the river was used to set the blocks that formed 50% of the structure (Bromblet, 2016). A rough calculation for the materials required for such a construction yields an estimation of 40 m^3 for 1 linear metre, meaning a total of around 200,000 m^3 for the entire monument if we limit its length to 5 km and if we disregard the 82 towers (500,000 tonnes for a density of 2.4 t to 2.8 t/m^3 according to the variable scoriaceous quality of the rock) (Assénat et Bessac, 2015). We are not aware of any lime kilns on the site, nor do we know where the fire wood came from. We were told by the workers involved that, until quite recently, wood was carried down from the mountains on the river.

The city plan is a stereotype that shows four roads which form a crossroad in the centre of a city crowned with walls (Assénat, 2016). Yet, the layout of the city's main roads is just as relevant for our topic. As illustrated by the plan, a *decumanus* (which is, in fact, quite likely to be the joining of two successive *decumani*) leads to the Tigris[23]. For Arab geographers, the

[22] The first historical mention of Amida was recorded in the form Amed(u) and deposited in the Assyrian Royal Annals in 866 BC, under the reign of the neo-Assyrian ruler Ashurnasirpal II (Grayson, 1991, 220).

[23] In his publication of Ammianus Marcellus, Guy Sabbah notes on this subject (complementary note 217) that in XVIII, IX, 1, the description of Amida does not exactly fit with the true aspect of the place. The bend in the Tigris that Ammianus sets to the South of the city "*To the South, the city is washed by the bend of the Tigris that appears close at hand, facing the Eurus, it towers over the flat stretches of Mesopotamy"* would actually be to the East. In fact, I am not certain that Ammianus sought to be very precise in his description and if he did make a mistake, it would rather have been in saying that the *erus* was a southerly wind and not an eastern wind, as the Tigris flows along the city both to the East and to the South where the loop of the Hevsel meander lies. We should note, however, that in XIX, V, 4 Ammianus described: "*At a point that was far from the southern part of the wall that stands over the Tigris, there was a tower that rose to a great height, at the foot of which lay a precipice of sheer rocks, that could not be seen from above without suffering the horror of vertigo; out of the bottom of this precipice was cut an underground vault and stairs that mounted from the foot of the mountain, leading to the city's terreplein; these were used to discreetly draw water from the river bed (…) and*

gate that allowed the road to cross the wall was called the "water gate" (Ducène, 2016: under publication) [24]. Today the gate is known as Yeni Kapı, which means the new gate. Of the four city gates, it is the only one that does not date back to Antiquity. However, close by there is a construction that does belong to the Antique wall and that is not a tower. The hypothesis that this vestige might be a part of the Roman gate cannot be directly refuted. The other gate, named the "hill gate" by Arab geographers (Ducène 2016: under publication), now called the "Mardin gate", stands at the southern end of the city's *cardo*. The road that runs from here, skirts the Gardens of Hevsel and joins the *Öngüzlü Köprüsü* bridge that spans the Tigris. Two main gates therefore link the latter to the river. This is also the case for a third bay that is rather particular and which we believe to be a ceremonial gate rather than one used for passage[25].

It is easy to see that the city hugs the relief and that the urban plan organises openings both upstream and downstream of the loop that forms the meander, which could explain why the *locus gromae* of the first city is far from the centre: it could not be positioned elsewhere if gates were to be placed in these two locations; the fact that it was shifted to the West is due to the distance between the gates.

The roads that pass through the city gates then travel on towards the river that must be crossed. 3 km downstream from the city lies a monumental bridge with 10 arches, hence known as *Öngüzlü Köprüsü*, and no doubt restored on any number of occasions. One of these restorations can be dated by a Kufic inscription engraved on six white limestone banners indicating that master Ubayd built the bridge in 457 (Gabriel 1940: 201-202; 336-337) (i.e. 1065), upon the orders of the Marwanid Emir Niz ad-Dawla (453-472), and this is confirmed in a text written by an Arab geographer Šaddād (Ducène, 2016: under publication). The work can be related to more ancient mentions.

The chronicle of 819 records that "*In the year 795 the Greeks (483/4) Mor Yuhanon Sa'oro of Qartmin of the abbey of Qartmin was made bishop of Amida, where he built a great and splendid church dedicated to the Fourty Martyrs of Sebaste and a bridge over the river Tigris outside the city"* (Palmer 1990: 12).

The Syriac chronicler Denys de Tell Mahré (? – 845) tells of the destruction of a bridge by an exceptional flooding of the river Tigris in the year 1054 (742-743) (Chabot, 1895: 29, [32]) [26]. According to the same chronicler, shortly after, in the year 1062 (749-750), rather particular circumstances made it possible to cross the river on foot: "*The rivers froze to such an extent that the horses could cross them at a gallop without breaking the ice beneath their hooves. Even the Tigris froze, and a long caravan of camels was able to cross while the*

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they were artistically polished...", and that it is in the north-east part of the city that the river lies the closest to the walls.

[24] This are: al-Muqaddasī last quarter of the 10th century; Ibn Šaddād, end of the13th century; al-Ḥimyarī first half of the14th century regarding the mentions of a "water gate, and Nāṣir-i Ḫusraw, December 1046 for the "Tigris gate".

[25] In fact, we wonder about the role of this gate, which does not appear to be connected to the city by a road, in the urban scenography. It is composed of a simple bay framed by two circular towers.

[26] "*In the year 1054 (742-743), the Tigris bridge, near Amida was destroyed. Winter had been harsh; snow had fallen in abundance from the sky and had built up on land over many days, to such an extent that all things of flesh were nearing their end. The animals, especially the birds, died. Then came harsh and chilling temperatures, wind and rain for a long time; the snow melted and the land was waterlogged by the melting snow. There was flooding in all of the rivers, and especially the Tigris. The banks of the river broke and violent flooding destroyed many men and lands. It carried much wood and the strength of the water was so great that large trees were driven against the big bridge and stacked up, one on the other, as far back as six miles upstream. Thus, the force of the colliding pieces of wood and the power of the flood smashed the bridge, which subsided into the water. It was not rebuilt, as Hisam, making haste to rebuild it, gathered together the workers, the stonemasons and everything needed to for its reconstruction, only to be struck down suddenly by death and the structure was left incomplete".*

ice did not even soften beneath their feet" (Chabot, 1895: 51, [57]).

Mathew of Edessa[27] also wrote that the emperor Tzimiskes, in around 973, destroyed a bridge (Ducène, 2016: under publication).

There were no doubt boat bridges in addition to this stone bridge. One or several of these were recorded by the Syrian geographer, Yaqut[28] (1179?-1229). He reported that according to the treaty of surrender concluded upon the Arab conquest of the city in 640, the inhabitants were obliged to maintain the bridge boats (al-ğusūr) in good condition and that, in exchange, they would not be subject to capitation (Ducène, 2106: under publication)[29]. This last point would tend to show the considerable importance of the task.

All of these elements bear testimony to the importance of land trade and outline the influence of Amida in Antiquity; its location, *ad Tigrem*, made it a hub for fluvial trade between the Persian Gulf, the Shatt al-Arab, northern Mesopotamia and beyond.

It would also be necessary to look for one or several port zones along the banks of the Tigris. According to oral testimonies, a bridge that allowed the mooring of a *kelek*[30] – the traditional rafts that floated on animal skins made into watertight, air-filled recipients and of which the oldest known model figures on a bas-relief from Ninive dated back to the 9th century BC – still stood at the foot of the citadel, under the current University bridge, some twenty years ago. The traffic on the Tigris, that we refer to here, had an impact on the city, in particular along the main roads which, we may note, remain bordered by *Hans* from the Ottoman period (Tuncer 1999).

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These elements, relative to circulation between the city, the meander and the river, are not the only aspects to furnish information on the site's economy. The observation and study of the terraces themselves, whose historical occupation is closely correlated with the geomorphological evolution, are obviously core to this question.

Some initial results have been obtained by Catherine Kuzucuoğlu and Sabri Karadoğan (2015), also exposed partly in Karadoğan 2017. Using GPS-measuredaltitudes, the authors drew a profile of the embedded terraces forming the Hevsel Gardens on the right bank of the Tigris meander below the City of Diyarbakır (fig. 5). These embedded terraces record major changes in the dynamics of the Tigris and of his sedimentary loads. Two corings have been performed in 2015, and other are planned in the closest future, for establishing the chronology of the incision and alluvation periods, as well as possible translation movements of the river within the Selmo Formation.

In the meantime, a certain number of elements can be assembled, providing information on the economy, in both its broad and narrower sense, of this area in Antiquity, and in particular its role in feeding the city, be this through the processing of grain or the direct contribution of subsistence crops. It should be noted that the Gardens of Hevsel benefited from a good water supply. The city and its surroundings actually boasted a large number of springs, the very term Hevsel comes from the Arabic word *awšāl*, the plural form of *wašl* "small stream" (Ducène, 2016). It is these springs, rather than the Tigris, that irrigated

[27] Dulaurier, 1858: 16

[28] Yaqut (1990): I, 76.

[29] J.-C Ducène specifies that the term *ğusūr*, the plural of *ğisr*, leaves no doubt as to the fact that there was one (or several?) boat bridge(s) spanning Tigris.

[30] On this subject see Tardieu, 1990: 71-102, i.e. the chapter called "Coutumes nautiques mésopotamiennes".

the gardens by gravity, before flowing into the river[31]. To these may be added the water drawn from outside the city and carried in. Zacharias Rhetor (Hamilton and Brooks, 1899: 156) mentioned aqueducts that, upon the siege of Amida by the Persian Kawad at the beginning of the 6th century, enabled the enemy to enter the city as far as the *tripyrgion*, which we propose to consider as the city's water tower (Assénat et Pérez, 2016: 67), and the presence of an aqueduct, still visible in the last century, reputed as dating back to the Ottoman period, but which may be even more ancient.

All of the water (and this is still the case) ran towards the Gardens of Hevsel. Channelled at two main points, its current was strong enough to action the mills. In the current configuration, beneath *Keçi Burcu*, near the Mardin gate, and beneath *Içkale*, there still stand several arrays of Ottoman mills from which water is collected to water the gardens. To what extent can this sub-contemporary scene be transposed to that of Antiquity? (fig.6)

Regarding the mills, it is indeed Amida that is quoted in the first known literary mention of this type of installation in Antiquity (Assénat et Pérez, 2015). It appears in Ammianus and is so exceptional that the publisher of *Histoire* did not know quite how to approach the hapax and translated "*Molina"* by "stacks" [32].

The literary tradition then went on to confirm the presence of mills with, in 1061, the tale of a Persian traveller Nasır ı Hüsrev (Korkusuz, 2003: 11), and in the 17th century with the description of the city left by Evliya Çelebi (Kahraman et Dağlı, 2012: 38-46).

Lastly, on site, in the lower part of the wall near *Keçi Burcu,* we can make out the contemporary drainage system of the Roman monument, that continues to drain part of the city's water. Connected to this were the aqueducts – part of which are still present and that we believe to date back to Antiquity - which supplied the Ottoman mills. Without knowing their exact location and in the absence of archaeological excavations, it nevertheless seems obvious to us that Ammianus' mills should be sought where the Ottoman mills stand today. The *Keçi Burcu,* protruding out over a recut basaltic spur, defended all of the installations (Assénat et Pérez, 2015).

This firmly establishes part of the picture in the loop of the Tigris. It identifies the organic relationship that linked the city to its wall, to its defence and to its self-subsistence.

Where did the grain come from? We might imagine that the grain milled in Amida was harvested over a large catchment area. On the left bank of the river, on the Silvan plain, there was a big wheat granary (Bruinessen, 1988: 39). Evliya Celebi talked of a river lined with rose gardens, vines, gardens and beds of basil (Kahraman et Dağlı, 2012: 37).

If the paleobotanical archives provide authorisation, the members of the research group also intend to work on the evolution of the Tigris riverside vegetation that accompanied the growth of the city, and on that of the botanical blend that may have been specific to the gardens. In any case we should note – and this question joins with that of the Istanbul workshop – that gardens appeared beside the city in the first literary mention of the site. In 866, the Neo-Assyrian king Aššurnaṣirpal II attacked the stronghold of Amedu, which was then capital of Bit-Zamani, a powerful Aramean principality, and destroyed its orchards. Even if we were unable to find these orchards, the mention of such landscapes recalls that the myth of Eden was formalised within a Persian political and cultural environment, in the 6th and 5th

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[31] Assénat, 2015: § 5-13. Ammianus Marcellinus lauded the presence of a spring within the city, doubtless that of Viran Tepe (Ammianus: XVIII, IX, 1). https://books.openedition.org/ifeagd/1226

[32] Sabbah, 1970, (XVIII, VIII, 11), "*...quem scissis collibus molinae ad calles artandas aedificatae densius constringebant."* by "stacks cut out of the hills and standing in close order to reduce the passageway". There is a remarkable parallel with the Latin inscription of the re-inscription by Constantine granting Orkistos, in Phrygia, the title of city, where we clearly understand that the mills are indeed a fully-fledged part of the poliadic characterisation of Orkistos (CIL III, 352 = *MAMA* 7, n. 305 (W. M. Calder).

centuries BC, in an upper-Mesopotamian context and questions the aspect that fluvial landscapes, such as that of Hevsel, must have had (Liverani 2008: 325 ***sq.***; Pérez, 2015).

We currently have no knowledge of the Antique irrigation system. Was it similar to that of the Ottoman system that gave the landscape the appearance of a *huerta*? In what proportion, and in which ways, did this *huerta* system reflect the consequences of the implementation of legal or customary provisions that regulated the use of water and its sharing in this particular setting?[33]

As the research stands today, we do not know if craftsmen's workshops (potters and blacksmiths, for example) stood on the riverbanks. Whatever the case, we should note that it is quite likely that the city's, the artisans' and domestic waste water also flowed through the gardens, and then into the river.

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In Amida, it is possible to identify a close link between the occupation and use of the site and the poliadic organisation of the city. The exceptional conservation of the urban layout, the walls, the basaltic cliffs, the Gardens of Hevsel and part of the system of water distribution connected to the mills, offers a fairly precise representation of the transformations that the city brought to its environment through its political establishment. The adaptation, to this site, of a stereotyped urban model – *cardo, decumanus*, fortification – is remarkable, as is the manner in which the configuration of the river's meander was put to profit. Here, we clearly see how the city was forged in this particular environment, how it adapted to its model, just as we understand that it is this very environment that granted Amida its particular character.

In the absence of archaeological investigations, many questions remain unanswered. We are in no doubt, however, that Amida, the Gardens of Hevsel and the Tigris, in this place, are a major historical reserve through which to study and understand the Roman Antique, Persian and Mesopotamian world.

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[33] For a related question see Aykan, 2015. Which also allows me to mention a wonderful film by the Georgian filmmaker Georges Ovashvili, *La terre éphémère*, winner of the Antigone d'Or at the Montpellier Mediterranean film festival of 2014, and that tells the story of the appearance and disappearance of a small island on the river Inguri.

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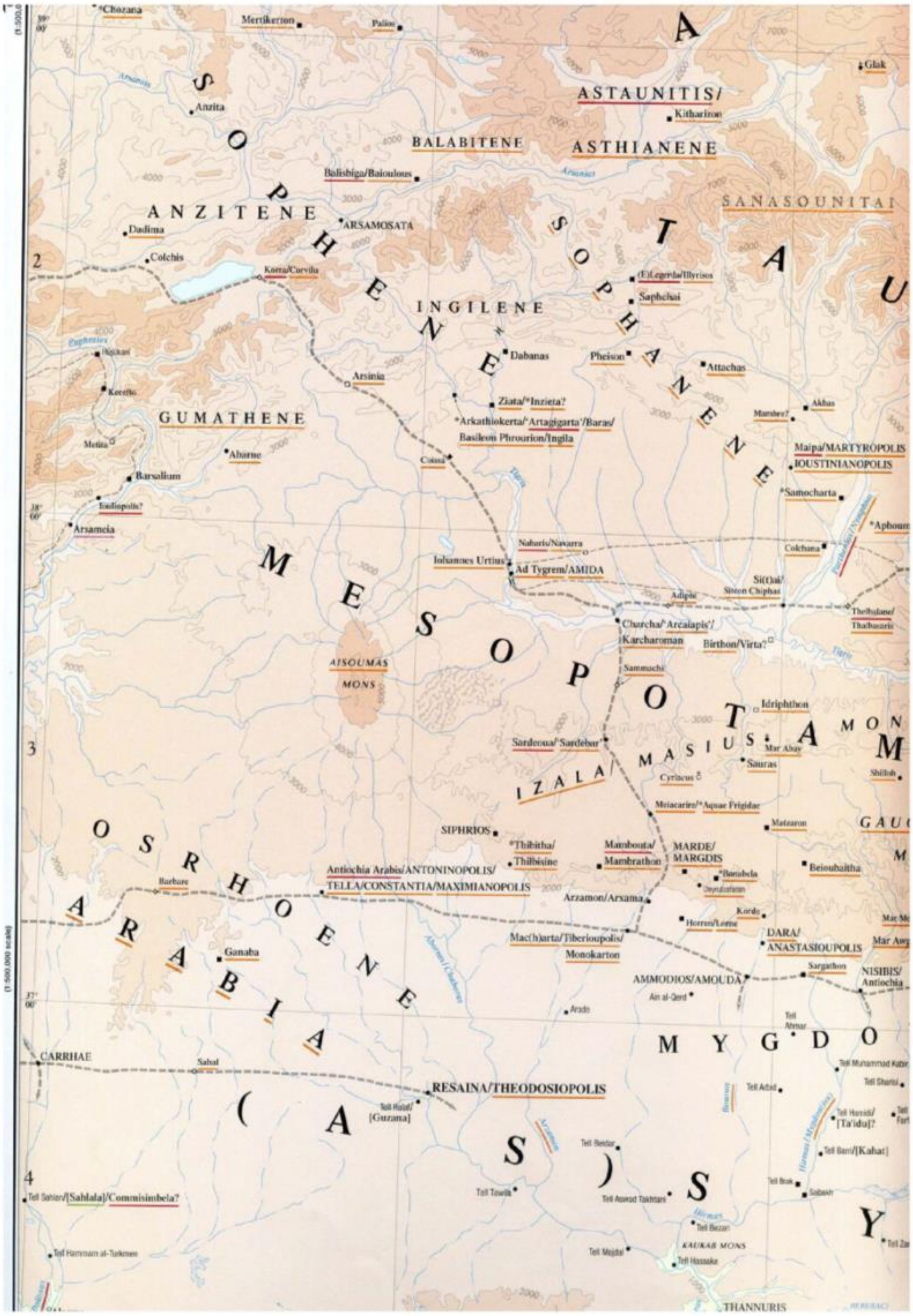

Fig 1 : Upper-Mesopotamia (Barrington 2000: 89)

fig 2 : Aerial view of Diyarbakir, the Hevsel's Gardens and the Tiger (kindly leased by Diyarbakir Municipality)

fig 3 : View of Diyarbakir - (kindly leased by Diyarbakir Municipality)

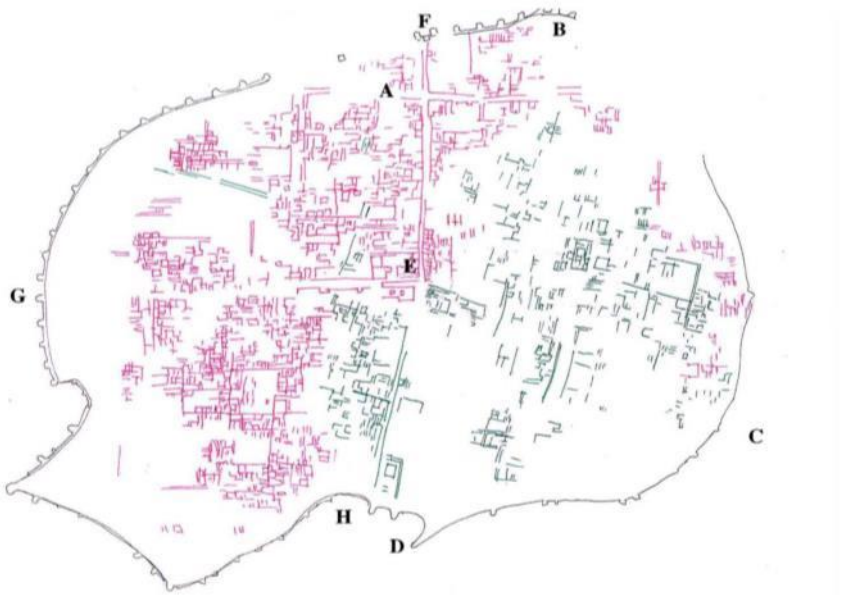

fig 4 : the two twons

F : Dag's Gate –
G : Urfa's Gate
H : Mardin's Gate
C : New Gate (Water's Gate)
E-C Decumanus of the first town
E-H Cardo of the first town
E-G Decumanus of the second town
E-F Cardo of the second town

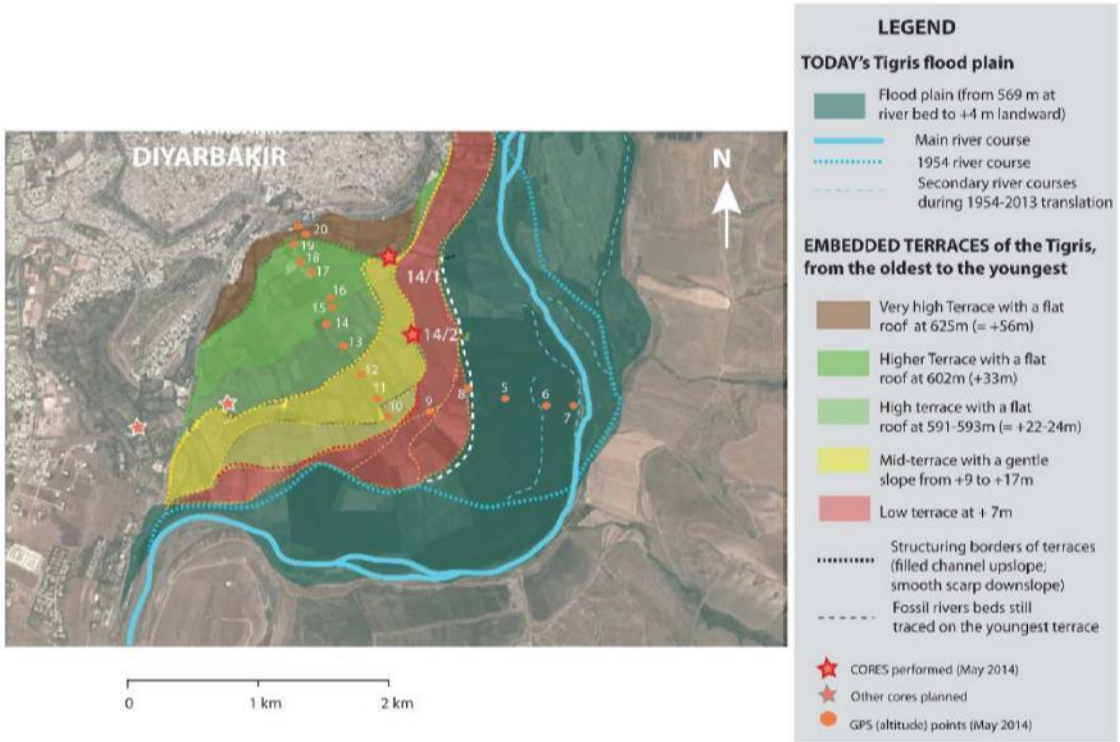

fig 5 : Catherine Kuzucuoglu and Sabri Karadogan (2015)

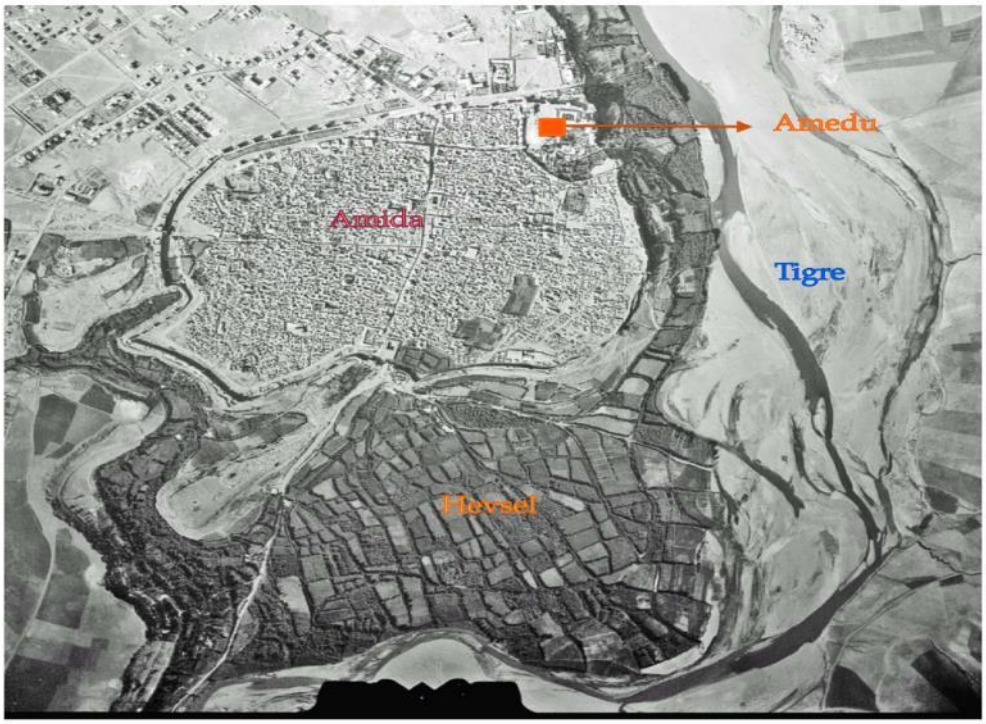

fig 6 The roads of water (Martine Assénat, Antoine Pérez : 2014)

Komait Abdallah (AOROC/ENS Paris, DGAM Damascus)

The Iconography of Fluvial Gods on Roman-Era Syrian Mosaics

Three mosaics representing river gods have been discovered within the frontiers of the present day Syria. The most ancient one was discovered in 1899, in the Almas'udiye village, close to Manbedj, in the Aleppo province. Dated by an inscription in AD 228, this mosaic represents the river god Euphrates, identified by two inscriptions in Greek and Syriac. The god is flanked by two feminine figures. In 1951, the Directorate of Antiquities in Lattakia found a floor mosaic of baths, from the first half of 3rd century, in the Galineh village, east of Djableh (on the Syrian coast). This mosaic includes many panels, among which one figuring a fluvial god, and another the personification of Alphios (river) with a female figure personifying perhaps Arethuse (the source). The third example is the mosaic of Alrastan on Orontes (in the center of Syria), discovered in 1980. Dating back to the second half of the 2nd century, this mosaic represents a fluvial god and the landscape including a river and a boat with two *putti* and drawings of edifices.

These three mosaics are interesting examples of iconographic representations of the fluvial deities in Roman Syria; they illustrate the importance of the fluvial cult in this region of the Roman Empire. An importance which is confirmed by several written sources

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The Orontes River as a Crossroad between the Regional Cultures in the Geographical and the Cultural Context

The Orontes River (Ὀρόντης, Turkish *Asi*, in Arabic *Āṣī*) is the only river in the region flowing in northern direction, draining from Near Eastern to the Levant coastline of the Mediterranean Sea. The Orontes river valley is the part of the Dead Sea Rift valley which begins from the African Plate, crosses Syria and reaches the Amuq Valley in Hatay. The river rises in the great springs of Labweh on the east side of the Bekaa Valley and it runs in a northern direction, parallel with the coast, falling 600 m through a rocky gorge. Leaving this, it expands into the Qattinah Lake, having been dammed back in antiquity. The valley now widens out into the rich district of Hama, below which lie the broad meadow-lands of Amykes, containing the sites of ancient Apamea. This central Asi–Orontes valley ends at the rocky barrier of Jisr al-Hadid, where the river is diverted to the west and the plain of Antioch opens. Two large tributaries from the north, the Afrin and Karasu, reach it here through the former Lake of Antioch or Lake Amik, which is now drained through the artificial channel. Passing north of the modern Antakya (ancient Antioch) the Orontes plunges southwest into a gorge and falls 80 m in 16 km to Orontes Delta and the sea just south of the little port of Samandagi.

The mountain range in the northern Levantine region is running parallel to the coastline on north-south direction and it divides the region as the coastal and the inland zones. Inland, the eastern part of the mountain range is bordered by desert; the settlements emerged between the desert and the mountain range, and along the coast. The ancient trade network from south to north followed the Orontes River valley connecting to the Amuq Valley to the north. The Amuq valley is known as crossroad of overland routes that connected to the Anatolian highlands in the North, northern Syria and Upper Mesopotamia to the east, Palestine and beyond the Egypt to the South, and the Mediterranean region to the West. Four principal cultural zones are connected by the natural corridors of the Orontes River Valley and the Amuq Valley in this interaction zone: the Anatolian, the eastern Mediterranean (Aegean-Cypriot), the Levantine, the Palestinian (Egyptian and Canaanite), and the northern Syro-Mesopotamian (Hurrian/Mitanni and Assyrian Babylonian).

The Orontes is not easily navigable and the valley derives its historical importance as a road for the north-south traffic lines from the Bronze Age to the Medieval Age, from Antioch towards south to Homs and thence to Damascus. This paper includes the following subtitles:

- The Characteristics and geographical features of the Orontes River
- The Orontes River in written sources
- How the Orontes River Valley acted in the interregional trade and cultural interaction between the Amuq Valley and the Delta.

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Holocene Sea-Level Rise, Palaeoenvironmental Evolution and Their Influence on Human Occupation on the Colchian Plain (W Georgia)

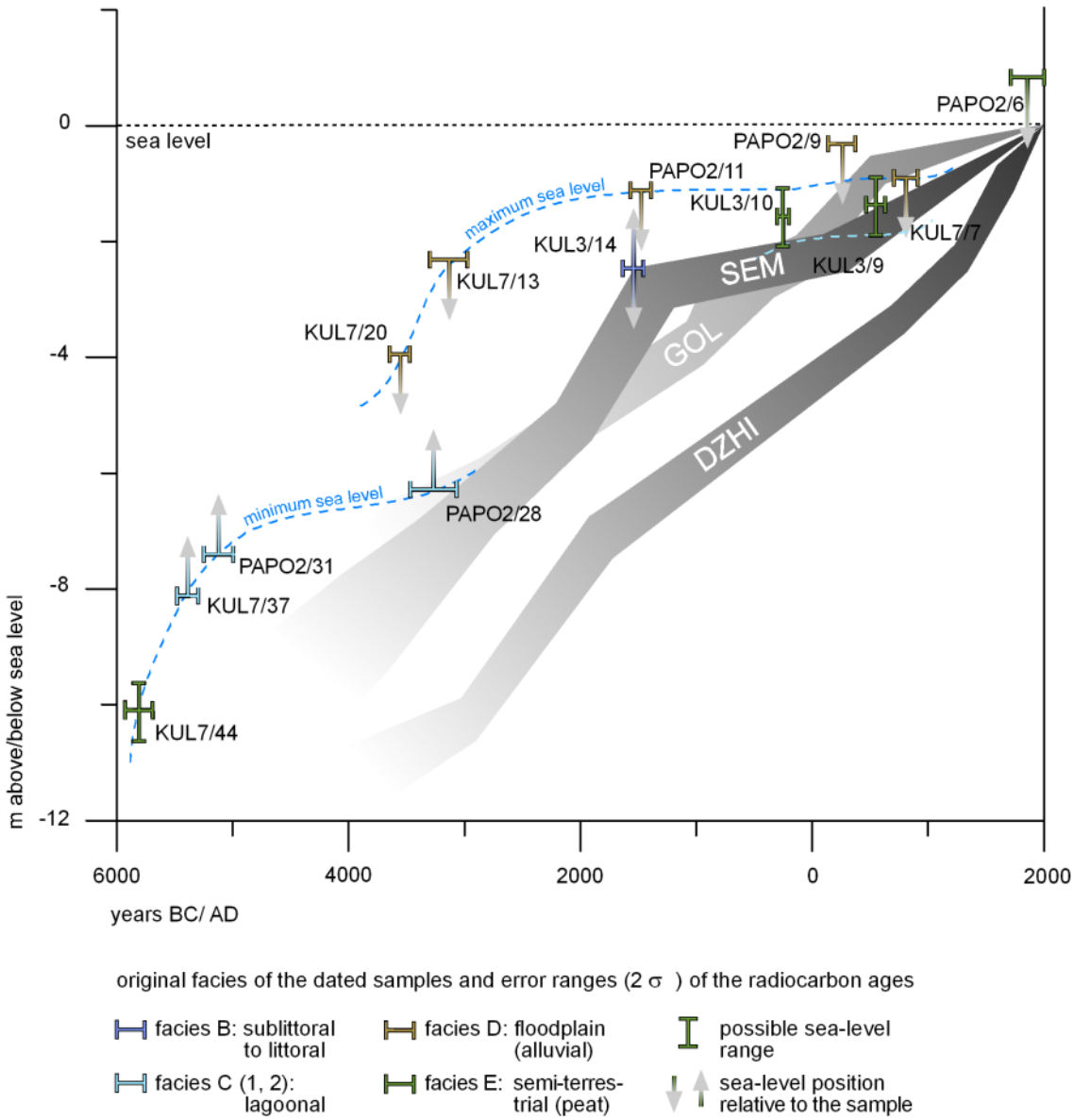
The Colchian plain forms the central part of the extensive coastal lowland along the Black Sea coast of Georgia. Due to continuous deltaic sedimentation and river progradation (e.g. of the Rioni), and to sea-level fluctuations of the Black Sea, considerable changes of the coastal configuration and the palaeoenvironmental conditions in the hinterland have occurred. Caused by the paucity of data regarding the Holocene coastal evolution of Western Georgia, this study aims to (i) determine the stratigraphy of the Kolkheti lowlands; (ii) elucidate the palaeogeographical and palaeoenvironmental changes along the Georgian Black Sea coastline; (iii) reconstruct the (relative) sea-level (RSL) evolution in the study area; and (iv) decipher the influence of these natural factors on the human occupation. This geoarchaeological research is based on sediment cores taken from different geo-bio-archives, which were analysed for geochemical and geophysical parameters (XRF, granulometry, LOI, CN analysis). The chronostratigraphy is based on IRSL and ^{14}C-ages.

Our results show that significant palaeoenvironmental changes have taken place in the surroundings of the Rioni delta during the last eight millennia: Shallow marine conditions dominated most of the research area during the 6th millennium BC. Later on, these deposits were covered by brackish/lagoonal sediments and, since the 4th millennium BC, by floodplain-related fine-grained alluvia. Both the lagoonal and alluvial deposits are interdigitated with peat layers. ^{14}C age estimates of the paralic peats enable the reconstruction of the RSL evolution for the study area, showing a deceleration between the 4th and 2nd millennia BC. The results confirm similar investigations conducted for the Taman Peninsula*. Both investigations falsify the major late Holocene regression-transgression cycles, especially the so-called Phanagorian regression, of the Black Sea.

The extensive floodplains in the coastal area were occupied by humans since the early 2nd millennium BC. More than 30 settlement mounds (local name *Dikhagudzuba*) between the rivers Khobistsqali and Enguri confirm a dense occupation during the Bronze Age era. Archaeological, historical and geoscientific evidence indicates a continuous occupation under similar circumstances for several centuries, which also contrasts the theory of several major sea level fluctuations during that time.

* Brückner, H., Kelterbaum, D., Marunchak, O., Porotov, A. & A. Vött (2010): The Holocene sea level story since 7500 BP – lessons from the Eastern Mediterranean, the Black and the Azov Seas. Quaternary International 225(2): 160-179.

Fouache, E., Kelterbaum, D., Brückner, H., Lericolais, G., Porotov, A. & V. Dikarev (2012): The Late Holocene evolution of the Black Sea - a critical view on the so-called Phanagorian regression. Quaternary International, 266: 162-174.



Compilation of ^{14}C-dated samples from the Kolkheti lowlands and their relative position to the local sea level. Horizontal bar shows ^{14}C dating result (2 sigma). The arrows pointing up/down indicate that sea level was higher/lower than the dated sample. In case of paralic peat (facies E; KUL 7/44, KUL 3/10, KUL 3/9), the sea-level range was narrowed to ±0.5 m. The data set is compared to sea-level curves from the Taman Peninsula in SW Russia, with the sites of SEM = Semebratnee (Brückner et al., 2010), GOL = Golobitskaya (Kelterbaum et al., 2011), and DZHI = Dschiginka (Fouache et al., 2012). The differences are due to different tectonic settings. For the study area, a continued and rather moderate rise in sea level for the last eight millennia is assumed.

Hannes Laermanns (Institute of Geography, University of Cologne), Daniel Kelterbaum (Institute of Geography, University of Cologne), Mikheil Elashvili (Ilia State University), Simon Matthias May (Institute of Geography, University of Cologne), Levan Navrozashvili (Ilia State University), Helmut Brückner (Institute of Geography, University of Cologne)

Sea-Level Rise and Coastal and Palaeoenvironmental Evolution in the Surroundings of the Rioni Delta (Kolkheti Lowlands, W Georgia)

The Kolkheti (Colchis) lowlands build the central part of the extensive coastal lowlands along the Black Sea coast of Georgia. Due to continuous deltaic sedimentation and progradation of the Rioni River, and to sea-level fluctuations of the Black Sea, considerable changes of the coastal configuration and the palaeoenvironmental conditions in its hinterland are considered. Because there is a paucity of data regarding the Holocene coastal evolution of Western Georgia, this study aims to (i) determine the stratigraphy of the Kolkheti lowlands; (ii) elucidate the palaeogeographical and palaeoenvironmental changes along the Georgian Black Sea coastline; and (iii) reconstruct the (relative) sea-level (RSL) evolution in the study area, and compare these results with other regional studies.

This research is based on ten sediment cores which were analysed for geochemical and geophysical parameters (XRF, granulometry, LOI, CN analysis). The chronostratigraphy is based on 4 IRSL and 13 ^{14}C ages.

Our results show that significant palaeoenvironmental changes have taken place in the surroundings of the Rioni delta during the last eight millennia: Shallow marine conditions dominated most of the research area during the 6th millennium BC. These deposits were covered by brackish/lagoonal sediments and, since the 4th millennium BC, by floodplain-related fine-grained alluvial deposits. Both, the lagoonal and alluvial deposits are intercalated by peat layers. ^{14}C age estimates of the different peats enable the reconstruction of the RSL evolution in the study area. The formation of the sand spit system started during the 2nd millennium BC. Luminescence dating of the oldest foredune ridges indicate a last mobilisation of the dunes between the 10th and 12th centuries AD. Based on these results, no evidences for a significant late Holocene RSL regression were detected. Taking into account previously conducted investigations and resembling RSL-curves from Taman Peninsula (SW-Russia) we consider a progressively and moderately rising sea level, with decelerated speed since 3000-2000 BC for the Georgian Black Sea coast.

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Dikhagudzuba – A Geoarchaeological Perspective on Bronze Age Settlement Mounds on the Colchian Plain (Western Georgia)

Situated between the rivers Enguri in the north and Khobistsqali in the south, more than 30 settlement mounds (local name *Dikhagudzuba*), identified by field survey and remote sensing techniques, give evidence of a densely populated landscape in the coastal lowlands of western Georgia during the Bronze Age. While the existing chronology of these mounds is based on ceramic evidence obtained during previous archaeological research, only limited information is available on their internal architecture and their palaeoenvironmental context, and the chronology of the different layers is lacking to date.

Vibracoring was carried out on top of and in the direct vicinity of three mounds, situated close to the villages of Orulu and Ergeta. Based on these sediment cores, our study aimed at (i) establishing a chronostratigraphic framework for the mounds based on ^{14}C dating; (ii) reconstructing possible phases and gaps in human occupation; and (iii) identifying the environmental conditions at the time of their use. Geochemical and sedimentological analyses were undertaken to decipher the element contents (XRF) and granulometry of stratigraphic layers.

The three investigated settlement mounds are similar in dimension and stratigraphy, and different settlement layers could be identified in each of them. The ^{14}C ages indicate that their formation occurred during the first half of the 2nd millennium BC, thus confirming the archaeological interpretation of their Bronze Age origin. For two mounds, an erection within the same settlement phase could be proven, whereas the third mound revealed different stages of construction. Heavy metal pollution in the anthropogenic layers indicates metallurgic activity during several phases of occupation. Based on the granulometric and geochemical data, palaeoenvironmental conditions in the area of the settlements were dominated by fluvial and alluvial processes. The construction material originates from the direct vicinity of the mounds. In the case of two mounds, circular moats, which are most likely contemporaneous, could be identified.

Mehmet Özalp, Saim Yıldırımer (Department of Forest Engineering, Faculty of Forestry, Artvin Coruh University)

A Decade of Change: Ecological and Social Outcomes of Constructing Large Dams between 2005 and 2015 within the Çoruh River Watershed

Human induced impact on natural river and/or stream ecosystems continually increases particularly in developing countries including China, Brazil, and Turkey. One of these impacts is to build large dams on running water ecosystems. The main purposes are the need of drinking and usable water, the production of electrical energy and flood control. Although they seem to provide many benefits for humans, they can also cause serious

environmental and social problems including: changes in the hydrography (water regime) and in the sediment distribution of the streams on which they are built; entire or partial destruction of aquatic organisms in the streams; deterioration of streamside vegetation and endemic plant species; inundation of arable lands and/or settlements around flood plains on the river side and forced migration of the people living in such places.

As for Turkey, building large dams has been one of the favorite development projects carried out lately, because the country is largely dependent on foreign resources for its ever-growing energy demand. The valley of the Coruh River in particular has been one of the hotspots that has been seriously affected by such projects: a total of 15 large dams were planned to be constructed on Coruh's main channel and its tributaries by the General Directorate of State Hydraulic Works of Turkey.

In this study, the focus will be on the middle and lower portion of the Coruh River flowing through the Artvin province because 7 out of the 15 large dams are to be built in this section of the river. During the 2005-2015 decade, four of these large dams (Muratlı, Borçka, Deriner and Artvin) were already completed and running while Yusufeli Dam, the biggest project of all, is under construction (Figure 1) and expected to be completed by 2018.

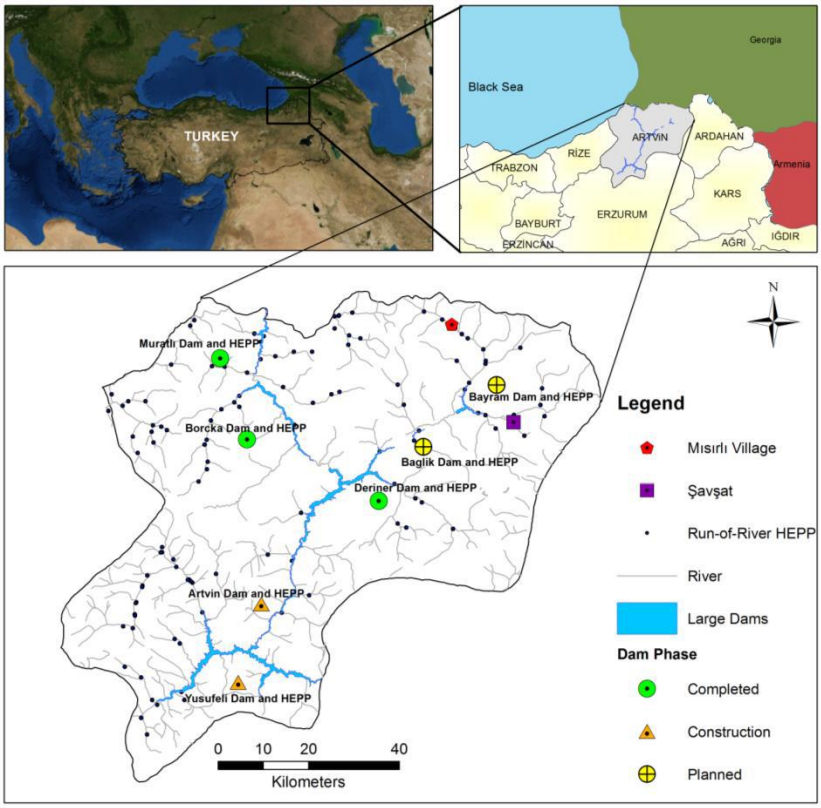

Figure 1. Study area showing large dams within the middle and lower part of the Coruh River Watershed in Artvin.

It is a well-known fact that the main adverse effect caused by these large dams is the changes they cause in land use types. For example, assuming that the reservoir lands of these 7 large dams within Artvin province are filled with water, it was estimated that a surface area of 8137 ha will be submerged under water. In other words, the results form scientific studies revealed that the lands used in Coruh River Watershed for various purposes such as forests, agriculture and settlements will be transformed to water areas due to these large dam projects. Among all the dams, the Yusufeli Dam will cause the largest effect in respect to the land use change since it will create a reservoir with an approximately 3219 ha in size, within the watershed (Figure 2).

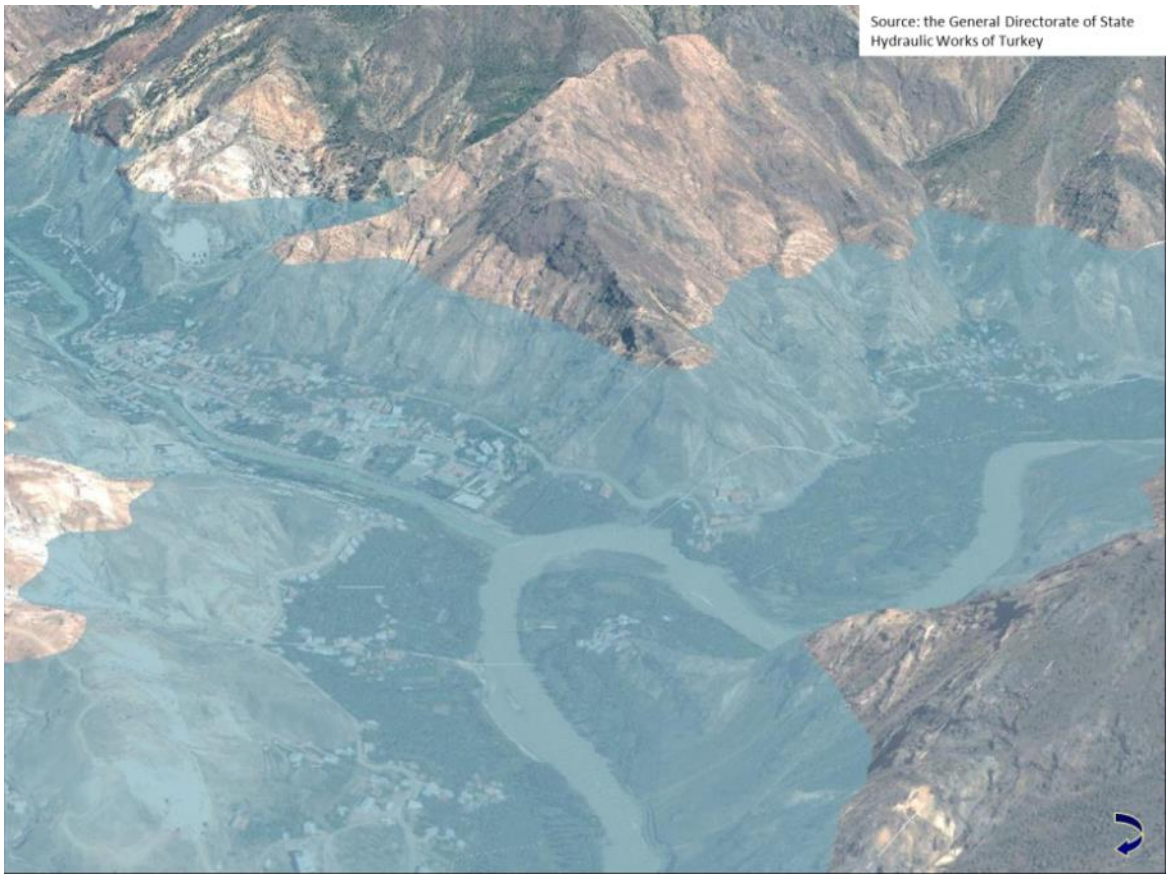

Figure 2. The city center of Yusufeli town, some villages and valuable agriculture areas along the floodplains will be left under water when Yusufeli Dam is completed by 2018

Moreover, this dam is also responsible for the major part of the settlement area to be lost since the center of the Yusufeli town and some of the villages will be submerged by the reservoir by 2018, causing 3031 homes to be affected directly and about 12124 people to be forced to migrate as well.

Izolda Machutadze (Batumi Shota Rustaveli State University)

Unique Habitats of the Rivers Khobistskali and Chorokhi (Central and South Colcheti) Mouth: Threats, Conservation and Wise Use

Throughout history, in the coastal area of Kolkheti, the habitats have been continuously degraded and disappeared as a result of human activity. This process has significantly increased since the beginning of the 20th century, because of irrigation activities and dams over rivers that accompanied urban projects. In many places, freshwater ponds were turned into dumpsites. A dump site at the right side of the Chorokhi River and on the right side of the River Khobistskali, which is a mouth of River Rioni, is a good examples. The general population shows a low degree of understanding of the importance of habitats and of their role in the ecosystems. Significant anthropogenic factors are the urban development, the infrastructural projects, the agricultural fields with invasive species, the use of biological resources, the low public awareness, the climate change and ecosystem modification, the water pollution, the uncontrolled tourism, the sea coast contaminated by household trash during the warm season.

Today, at the Anaklia-Churiariver mouth of the Khobistskali and Rioni rivers, the virgin Kolkheti forest is being felled and drainage canals laid for the construction of the large Kulevi oil terminal. Consequently, groundwater basins are no longer replenished and the community does not have drinking water.

Anthropogenic pressure factors, such as the artificialization of the coastal zones, the building of marine terminals and other large coastal infrastructure, as well as the weak environmental awareness in all respect are leading to the destruction of these areas, and to the irreversible disappearance of attached species. Part of the problem is the lack of legislation for the habitat protection and of mechanisms to protect smaller habitats located outside the formally protected areas. In the Batumi area, the so-called Ardagani Lake area (ca. 45 ha), housing all three species of *Trapa* with the *Typhetum-Phragmitetum* island in the middle of the habitat, hosting many migratory birds, was surrendered to coastal boulevard development. This lead to the destruction of the habitat and the disappearance of its species.

There is interdependence between the species and its habitat. Relicts and endemic plants can develop in their historically established habitats. The habitat is a micro-ecological environment, created by its plants. In order to save the biodiversity of per-humid ecosystems of the Kolkheti coastal area, to implement protection and management of threatened species, it is necessary to activate and toughen the measures for environmental protection as well as to create local protected areas. The importance of protecting ecosystems cannot be overestimated. They form homeostasis that allows communities of species to function normally. Disappearance of even one species leads to misbalance between species interaction. Therefore all these habitats must be fully protected. It is necessary to conduct *ex-situ* conservation activities.

Georgian environmental legislation includes law about fauna but there is no similar law concerning the habitats. In order to protect the endangered species, it is necessary to protect their habitats as well, and immediate action is required in this respect to address the further loss of small but valuable habitats and dependent species along the Black Sea coast of Georgia.

Mamuka Gvilava (ICZM National Focal Point for Georgia)

Remote Sensing of River Discharges – The Case of Rioni Catchment

Discharge is a critical *in situ* parameter to calibrate and to validate water quantity and water quality in river catchments discharging into the marine environment. Hydrological modelling is indeed a key instrument to complete the quantitative assessment of river catchment ecology and to enumerate impacts of pollution loads into the sea. Nutrients loading from river catchments are of particularly considerable importance for enclosed marine environments such as the Black Sea.

Open source tools and instruments, promoted for use within several European supported projects (such as FP7 enviroGRIDS and BSB CBC ILMM-BSE), were applied to data scares regions around the Black Sea, while compensating for unavailable discharge data with determinations through satellite remote sensing. Case of Rioni River is reported in this communication as a testbed for this novel approach.

In particular, open source Soil and Water Assessment Tool ArcSWAT was employed to set-up the hydrological model for Rioni River Basin. Global 30 m resolution land cover, 30 m Global DEM, and FAO soils cover data (complemented with the national soils in 1/500,000 scale), combined with globally available climate datasets in ArcSWAT input format allowed to set-up and run the hydrological model for Rioni Catchment, but weak quality (and lack of public availability) of hydrological discharge measurements would not allow to calibrate and validate water quantity model.

To compensate for the lack of *in situ* discharge data, a thought experiment was performed applying remote sensing to address discharge data scarcity. Indeed, recent advancements make it increasingly possible to derive river discharge data based on satellite microwave observations. Due to satisfactory visual fit of the *in situ* measured and microwave satellite observation data, it was speculated, that instead of the use of global hydrological model to derive absolute values for river discharge time series from satellite observations, one could combine microwave satellite data (available in relative values), with absolute figures obtained via 'at-many-stations hydraulic geometry' river width based methodology, described in literature, in order to recalculate relative values of satellite measurement time series into absolute values for river discharge. It was demonstrated, that the high resolution instruments of the European Sentinel satellite series would allow for the measurement of the required parameters for wide width rivers such as Rioni, thus sensing discharge data remotely, and calibrating and validating the hydrological model setup.

Similar calculations can be extended to any comparable river basins around the Black Sea, and elsewhere.