The Silk Road

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"The Bridge between Eastern and Western Cultures"

In This Issue

Next Issue

A special focus on Xinjiang, including:

- Xinru Liu on viniculture
- James Millward on Kashgar
- an annotated bibliography of recent Xinjiang studies

and also:

- Connie Chin on scripture and commerce at Buddhist sites
- Dan Potts on camels

and more....

About

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Please feel free to contact us with any questions or contributions. Guidelines for contributors may be found in Vol. 2, No. 1 (June 2004) on the website.

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From the Editor

1907 was a year of remarkable coincidence. In March, after a winter of stunning discoveries in the desert, Aurel Stein arrived at the Mogao Caves near Dunhuang. After learning there of the "Library Cave," he returned to his excavations along the Dunhuang "limes," in the process uncovering the famous "Ancient Sogdian Letters." Back in Dunhuang, he would then pack off to London a major part of the treasures from what we now know as Cave 17. As readers of this newsletter know, the study of the Silk Road would never be the same. Less familiar, I suspect, is another event in 1907, which would also result (but not immediately) in a portentious discovery. In July of that year, when the boxes of Dunhuang manuscripts were already on their way to Europe, the pre-eminent paleontologist of his day, Charles Doolittle Walcott, first visited the region of the Burgess Shale quarry in western Canada. His discovery of the spectacular fossils there would occur only two years later, and their careful study to arrive at full understanding of their implications would be the work of a later generation. Paleontology has never been the same.

Recently I was inspired to re-read the late Steven Jay Gould's *Wonderful Life: The Burgess Shale and the Nature of History*, in which he makes an eloquent, if controversial, case for the significance of the unprecedented explosion of animal life at the beginning of the Cambrian era, some 500 million years ago. The evidence for this is in the fossils of the Burgess Shale. Apart from what his book tells us about our ancestors (very) far removed, it is stimulating for what it reveals about the uncertain paths of scientific discovery. It is a tale about the questioning of old paradigms, about the impact of institutional and conceptual limitations on scholarship, about imagination and new techniques, and about contingency. At the risk of stretching the analogies, I find interesting parallels between the story of studying the Burgess fossils and what we learn about the changing world of scholarship in contributions to this issue of *The Silk Road*.

Aleksandr Leskov's article on the "Maikop Treasure" re-thinks the old paradigms about this collection of early nomad artifacts. Like the Burgess fossils, the Maikop Treasure was dispersed in separate locations where it had never been fully studied. It has taken Leskov's careful analysis to "reunite" it and establish (insofar as the record allows) its history. This work is something akin to dissecting the layers of the compressed soft-bodied animals of the Cambrian era in order to establish their three-dimensional form. While his accomplishment is the fruition of a lifetime's study of steppe archaeology and employs what we might characterize as traditional methods, it also the story of institutional constraints and the accident of fate whereby Leskov felt compelled to abandon his prestigious academic career in Ukraine and emigrate to the United States. Leskov's case serves as a salutory reminder of

how politics and scholarship rarely mix to the benefit of the latter.

As we learn from James Vedder's article, steppe archaeology has challenged us to re-examine the long-known evidence of epic and art regarding the Amazons. His material is part of a larger body of evidence and reinterpretation which is positing a factual basis for what commonly had been seen in traditional Classical scholarship as figments of the active Greek imagination.

A substantial focus of this number of *The Silk Road* concerns the application of the newest technology as a means of organizing and comparing not only the full range of archaeological evidence for Inner Asia but also a massive amount of new material on ecology, climate, and much more. Just as we can now visualize the three dimensional form of the Burgess animals, so also, thanks to Geographic Information Systems (GIS) applications, we can begin to construct multi-dimensional images of archaeological sites and changes in patterns of human and natural history.

The collection of short pieces by Mariner Padwa, Sebastian Stride et al. reminds us how good scholarship depends on not just imagination but on dogged, hard work in assembling and organizing data. It may come as something of a shock to realize that multiple encounters with the same archaeological site have sometimes led to its being recorded in different locations. Developing precise geographic coordinates for localizing cultural information is thus essential, and is far from an easy task, where the evidence of earlier mapping must be correlated with the precise data obtained from satellite imagery. I admire the relative accuracy of the mapping by Stein and Hedin in conditions that would test the stamina of most of us, but I am also mindful of the fact that some of Hedin's maps were keyed to the pace of the camel he was riding while taking compass bearings and sketching. We have now entered a different world of precision, but the only way to take advantage of what the technology has to offer is to convert the accumulated historic records. One can hope that the coordinated activity of these several projects focussing on relatively small portions of Eurasia will inspire the extension of this kind of work so that eventually data for all regions will be connected seamlessly.

It is clear that already these projects are revealing new information on routes of trade, defensive lines and patterns of communication. If there has been a tendency in popularizations to oversimply *the* Silk Road, we are reminded here of the complexities of the Silk Roads. We can hope that the new documentation of archaeological sites will help in the effort to study and preserve them in the face of modern development and looting. And lastly, a great virtue of these projects is their intent to make the material fully available to everyone via public-access Internet sites. Scholarship will never fulfill its mission if it remains inaccessible to all but a privileged few.

Finally, I am delighted to note our contribution from Michael Wright, who contacted me after we publicized the previous issue of this newsletter. Attention to music along the Silk Roads often focusses on the eastward movement of instruments such as the lute (famous examples being in the Shosoin imperial repository in Japan), or evidence of Western influences as documented in T'ang-era *mingqi* or mural painting. As Wright demonstrates, the "Jew's Harp" has a fascinating history of transmission across Eurasia, most likely in the opposite direction. As in so much else these days, archaeological evidence forms an important part of the documentation.

Whether you are already involved in archaeological work or, like me, are looking forward to your first experience on an excavation, the Silkroad Foundation is offering an excellent opportunity to participate in one this summer. Information may be found at the end of this issue. Most histories of the Silk Road begin with the story of the interactions between the nomadic Xiongnu and Han China more than 2000 years ago. This summer program will focus on Xiongnu sites in Mongolia.

Silk Road studies have come a long way as we approach the centennial of the great discoveries of 1907. Were we to return in yet another century, we might well be surprised to learn how little we know now.

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Belt plaque with a tiger attacking a wild donkey. Eastern Zhou Dynasty, Warring States Period, 480-222 BCE, Ordos Region. Gilded bronze. Museum für Ostasiatische Kunst, Berlin, Inv. Nr.1965-24a. Photo: Daniel C. Waugh, 2004.

The Maikop Treasure

Aleksandr Leskov
University of Pennsylvania, Philadelphia

Fig. 1. Gold plaque in the shape of a winged, walking griffin. Adornment of a fabric. H. 3 cm. 5th c. BCE.

To properly begin the story of the so-called Maikop treasure, one must say at least a little about M. A. Merle de Massoneau. The founder of the Bank of the Orient in Paris, he had worked for a long time as the director of the Russian royal vineyards in the Crimea and in the Caucasus. His position clearly indicates not only his material wealth, but also his high social status, and explains as well as the regular work-related trips he had to take between the Crimea (where he lived in Yalta) and the Caucasus.

During the nearly twenty years he lived in Russia, de Massoneau had amassed a truly enormous, unique collection.[1] Several documents allow us to judge its size. Robert Zahn, a famous German archaeologist, for example, informs Berlin about de Massoneau's collection: "The collection contains various Greek and Roman antiquities, typical for the south of Russia. Furthermore, it seems to me that the wares made during the time of the great migrations (golden decorations, etc.) are very good, the Islamic ancient objects as well as the medieval objects from Circassian tombs (a large collection of weapons) are all very rich."[2]

According to the purchase inventory, 956 inventory numbers from de Massoneau's collection, bought on May 30, 1907, went to the Berlin Museum's Department of Prehistory alone. This constitutes approximately one half of the collection — in his already cited letter, Dr. Zahn writes that the entire colection, bought for 95,000 DM, was divided among three departments of the Berlin Museum. The Prehistory Department contributed 45,000 DM (of which 42,500 DM came from Mr. Von Diergardt), while the Department of Near Asian Art and the Classics Department contributed 25,000 DM each [Damm 1988, pp. 65-66]. I do not know the number and character of the items acquired by the Department of Near Asian Art, as they have little relevance to the archaeology of the Black Sea area. However, according to the purchase inventory on June 14, 1907, 809 inventory numbers went to the Classics Department.[3] The overwhelming majority of these items were found in the ancient cities of the Bosporan Kingdom, 5th century BCE — 3th century CE, and in the synchronous barbarian monuments which belonged to the Scythian, Sarmatian, and Meothian areas. And this is not surprising, as the main excavation sites in Russia during the 19th and early 20th centuries were ancient Greek cities: Olbia, located in the mouth of the Southern Bug river; Chersonesus, on the southern tip of the Crimea; Panticapaeum, on the eastern side of the Crimean Peninsula; and Phanagoria, a town on the Taman Peninsula. Also extensively excavated were the barrows of southern Russia, primarily in the Crimea, the nearby steppes of the lower Dnieper River's left bank, and the northwestern Caucasus (from Taman to Maikop). Not long prior to de Massoneau's arrival in Russia, long-term excavations of extremely wealthy barrows such as the Major Bliznitsa, Seven Brothers and Karagodeuashkh in the northwestern Caucasus, and the Nymphaeum barrows in eastern Crimea, were concluded. During de Massoneau's stay in Yalta, the most famous Scythian barrows in Crimea were excavated: Golden, Talaevskii,

Fig. 2. Gold plaque in the shape of a walking stag. Adornment of a fabric. H. 3 cm. 5th c. BCE.

Dert-Oba, and Kulakovskii (1890-1895). Meanwhile, discoveries were made of the Deev and Oguz barrows a little to the north in the steppes of the modern Kherson region, and of the Shulgovka and Ushakovskii barrows further to the east, near the Azov Sea and the lower Don River areas. The richest finds of the times, however, were made in the Maikop area. First and foremost comes the Maikop barrow itself, the richest burial from the 3rd millennium BCE ever seen outside of Greece; the First Ul'sk barrow, the tallest in the area south of the Kuban River at 15 meters high, the central part of which alone contained the skeletons of 360 horses; and finally the rich Kelermes barrows,

Fig. 3. Gold plaque — appliqué with a bent upper edge. Adornment of a wood vessel. H. 5 cm. 5th c. BCE

as well as those of Kostromskoi, Kurdzhipis, etc. Sensational discoveries followed one another in quick succession. The names of A.E. Lutsenko, I.E. Zabelin, V.G. Tizengauzen, N.I. Veselovskii, and others were widely known in Russia and western Europe. Thousands of gold and silver decorations, vessels, weapons and horse trappings, including masterpieces of ancient Asian and ancient Greek art found in the South of Russia at the end of the 19th and the beginning of the 20th centuries, constituted a veritable archaeological boom. Newspapers and journals regularly reported more and more sensational discoveries, and collecting antiquities became a fashionable and prestigious activity.

Unfortunately, this "gold fever" led to a troubling increase in grave robbing and to the appearance of large amounts of archaeological materials on the black market. Unlimited possibilities for private collectors were thus created, the best example of which is perhaps the collection of Merle de Massoneau.

In 1907, de Massoneau considered the unstable political situation in Russia and sold his collection to the Berlin Museum. The sale was formalized on May 30, 1907. However, this sale represented only a part of antiquities from Russia that belonged to de Massoneau. In 1922, a catalog of the remainder of the de Massoneau collection was published in Paris. Exhibited for sale, this "remainder" contained 117 lots of various gold, silver, bronze, ceramic marble and ivory objects from the Cimmerian Bosporus.[4]

I do not know how many of the items exhibited for sale in 1922 were actually sold, but I do know that one John Marshall, an agent of New York Metropolitan Museum's department of Greek and Roman antiquities bought 32 gold plaques from the de Massoneau collection on August 11, 1924, plaques that were not described in the catalog above.[5] The meaning of this small purchase is difficult to overvalue: of the six types of plaques represented, four types (30 plaques) have direct analogs in among the materials of the Classics Department of the Berlin Museum, where there are 282 plaques of these types [Greifenhagen, 1970-1975, I, p. 60, Fig. 37, 1-3; p. 58, Fig. 33, 1-2].

The Berlin plaques constitute a part of the collection the Classics Department bought in 1913 from Karapet, an Armenian merchant[6] who declared the items came from the famous Chmirev barrow excavated in 1910 [Veselovskii 1909-1910, pp. 127-129; figs. 190-202]. Sometime later it was shown that the same four types of golden plaques were represented by 38 items among the several hundred in the collection of the University of Pennsylvania Museum of Archaeology and Anthropology (Philadelphia, USA). This collection was acquired by the museum in 1930 under the name of the "Maikop treasure." It is worth noting that the collection of the Berlin Museum's Classics Department (acquired in 1913) and of the University of Pennsylvania Museum share more than ten other types of golden wares, represented by many items.

The similarity of a significant number of items belonging to the three different collections attracted the attention of Mikhail Ivanovich Rostovtzeff, who in 1931 came to the conclusion that here was a single "very rich discovery, made [as he thought] in 1912 in the Kuban region, probably in the Maikop area, and subsequently sold to three (or more?) parties," namely the Berlin, Metropolitan, and University of Pennsylvania museums [Rostowzew 1931, p.

Fig. 4. Bronze harness plaque in the shape of a wolf's head. If this plaque is turned with the wolf's head pointing down, then a mountain goat's head, facing right, is clearly visible. L. 5 cm. 4th c. BCE.

368]. Rostovtzeff emphasized that bronze details of a set of horse trappings from the Berlin collection indicated the Kuban origin of the items in this collection [Rostowzew 1931, p. 367]. It is necessary to add that the University of Pennsylvania collection contains many items analogous to those in Berlin. Moreover, it appears that some items from the University of Pennsylvania and Berlin originate from one complex.

Not doubting the unified nature of the University of Pennsylvania and Berlin collections, Rostovtzeff then determined their date using a black-figure kilicos (from the University of Pennsylvania museum — A.L.) that he dated to no later than the first half of the 5th century BCE. Note that Rostovtzeff is dating only the part of the collection that belongs to the Scythian times [Ibid.]

In 1970, Adolf Greifenhagen published a catalog of gold and silver decorations from the Berlin Museum's Classics Department [Greifenhagen, 1970-1975]. Of this fundamental, two-volume publication, we are concerned with 1) Materials bought from de Massoneau in 1907 (Vol. I, Figs. 18-28) and 2) Materials from Maikop bought in 1913 (Vol. I, Figs. 29-38).

1. Items bought from de Massoneau (more than 250 in number) are typical for Greek

towns in the northern Black Sea area and their necropoli. Meanwhile, practically any of these objects can be seen in monuments of local populations during Scythian-Sarmathian times. Only a few (about 10 types of items) are characteristic of not Greek but rather Scythian, Meothian, or Sarmathian monuments from the south of Russia. Thus we will return to consider them later.

2. To precious items published under the "Maikop" designation, Greifenhagen adds 45 items, mostly made of bronze but some also of silver and iron, from the same collection the museum had acquired in 1913. Let us note immediately that 13 out of the 45 published items made of bronze, silver and iron belong to the pre- and post-Scythian times [Greifenhagen, 1970-1975, Vol. I, p. 56, Figs. 25-28, 31-34, 39-43].

During my work on the Maikop collection in the Classic Department of the Berlin Museum, I discovered that in 1913 significantly more items were acquired than Greifenhagen could publish. The problem was that a number of items had disappeared during the Second World War. However, brief information regarding these items remained in the museum's inventory. According to this document, there were about 40 more exhibits (more actual objects) in addition to those described by Greifenhagen. The majority of the items which had disappeared were made of bronze, although some were made of stone, bone, glass, clay, silver and gold. Most of the bronze items were horse-trapping details, some manufactured during pre-Scythian times and some made in the Scythian animal style. This unpublished material completes Rostovtzeff's observations regarding the unity of the three collections in the University of Pennsylvania, New York, and Berlin (Classics Department). Apart from the four types of golden plaques on which Rostovtzeff's argument depended, we now possess a much larger material from Scythian times as well as pre-Scythian, Sarmathian, and medieval eras.

The unity of the three parts of the collection is beyond argument when its fourth part is also considered. Again it is impossible to not appreciate Rostovtzeff's foresight when he wrote in 1931 about "three (*or more*?)" (emphasis mine—A.L.) buyers of the once unified collection. I mean the part of de Massoneau's collection that went to the Prehistory Department of the Berlin Museum also in 1907, at the same time that another part of the same collection was being acquired by the Classics Department of that institution.

We can only be surprised at the fact that objects of the same type, and plainly identical, could lie in adjacent departments of the same Berlin museum for almost a century, and that none of the specialists paid this fact much attention. In this regard, it is interesting to note that as soon as the famous scholar Robert Zahn found out from its 1925 publication [Alexander 1925, pp. 180-181, Fig. 7] that the Metropolitan Museum had bought golden plaques from de Massoneau's collection, he pointed out to his New York colleagues the fact that identical objects existed in the Classics Department of the Berlin Museum, where he worked, while the bronzes from the neighboring Department of Prehistory

remained unnoticed. Meanwhile, the part of de Massoneau's collection that went to the Prehistory Department contained 88 items of pre-Scythian, Scythian, Sarmatian and medieval times.[7] Sixteen bronze details of horse trappings, fashioned in the Scythian animal style and that belong to this part of de Massoneau's collection were published by H. Shmidt,[8] six of which were published again by Johannes Potratz [Potratz 1960, p. 61, Fig. X.26, XI.28-31; Potratz 1963, p. 80, Fig. 59]. One more was published by Ellis Minns [Minns 1942, P. 1, Ill. I], while none of the rest, as far as I know, was ever published. It is necessary to add that some items disappeared during the Second World War and are known to me only from the surviving old negatives and from drawings made in the museum inventory (IIId 7015-7035).

It seems we will never be certain of the method de Massoneau used to divide his collection as he prepared it for sale. It is clear that, being a good businessman, he understood that if his entire enormous collection was sold at once, its market value would be lowered. De Massoneau was probably correct in his financial calculations. In negotiating with the directors of the combined Royal Museum in Berlin, he offered to sell the items he knew would interest the directors of specific departments.

Thus the Classics Department in particular bought the items originating from ancient towns and their necropoli located in the northern Black Sea area [Greifenhagen 1970-1975, Vol. I, pp. 41-53, Figs. 18-28]. Meanwhile the Prehistory Department acquired the largest part of the de Massoneau collection, where the most notable material consisted of the treasures from the time of the great migrations. Perhaps it was their illustrious company that kept the one hundred or so bronze, iron, and ceramic items characteristic of pre-Scythian, Scythian, and Sarmatian periods from being noticed. From the above letter by Dr. Zahn, it is known that the collection offered to the Berlin Royal Museum was bought in its entirety.

Six years later, in 1913, the second half of the de Massoneau collection was delivered to Berlin by some merchant named Karapet, and was offered by him as materials from the Chmurev barrow located in the steppe on the left bank of the Dnieper River. As we see, everything was done to disassociate the name of de Massoneau from the collection on sale. After all, by that time de Massoneau had not been living in Russia for a long time, he had sold his collection, and the Chmurev barrow was located far enough from Crimea and northwestern Caucasus, the origins of at least 90% of de Massoneau's archaeological collection. The strategy seemed to have worked — half of the items was bought by the Classics Department of the Berlin Museum, which, as Greifenhagen rightly noted, now became the largest depository of antique jewelry from the south of Russia after the Hermitage in St. Petersburg [Greifenhagen 1970-1975, Vol. I, p. 10]. The second half of the collection was acquired by Ercole Canessa, at the time the most famous antique dealer in the world.[9] It remains unclear whether Canessa had bought this part of the collection in Berlin, or whether it was first delivered to Paris, where de Massoneau now lived and where one of Canessa's galleries was located. It is only known that Canessa moved his collections from Paris to Italy in 1914, due to the outbreak of the First World War.

When the Italian government decide to allocate a special exhibition area for Canessa's collections in the Italian pavilion of the Panama-Pacific International Exposition in San Francisco, his materials were delivered from Genoa.

In 1915, in the context of this exhibition that was the biggest cultural event of the year, Canessa showed his collections and published a catalog, where Scythian treaures were shown in the U.S. for the first time [Canessa 1915, lot no. 2]. In the catalog, "treasures found in the tombs of the Scythian region of the Caucasus — Greek work (VI century BC)" were published as number 2. Then there was a brief list of all exhibited items, all of them characterized as Scythian except for one silver cup that was said to belong to the "period of the Sacae" [Ibid.].

After the San Francisco exhibit had closed, Canessa wrote to the museum of the University of Pennsylvania about the possibility of its buying a number of items from him, as well as about some photographs he had sent the museum. Certain Scythian objects, offered to the museum along with Greek and Roman antiquities, are first mentioned in the June 26, 1916 letter from Canessa to Stephen B. Luce, then director of the Mediterranean Section of the museum.

The Scythian items, however, did not interest the museum at that time. In the July 10, 1916 letter, Canessa asked Luce to return him the photographs of the Scythian items, which was done immediately — on July 12, Canessa wrote that he had received the photographs.

One year later, Canessa organized an exhibit in his New York gallery, where, according to the catalog's "Greek and Roman Goldsmith Work" section, he was selling the same treasures from a Scythian tomb from the 6th

century BCE [Canessa 1917, Lot no. 1]. The characterization of this lot is identical to that of the San Francisco catalog from 1915. In the next and the largest catalog of the Canessa collection, published in 1919, the section "Greek and Roman Gold and Silver Objects" opens with lot #78, where the materials that interest us are introduced as treasures discovered in the Kuban region in the Caucasus, in Southern Russia. In short, although the entire lot is dated to the 6th century BCE and the already familiar silver cup is still said to be from the period of the Sacae, the objects are no longer purported to come from the same complex [Canessa 1919].

All items are divided in three sections: A — gold and silver wares; B — bronze objects; and C — objects manufactured from various materials, such as clay, stone and glass. In all, the list of items completely repeats the lists from 1915 and 1917.

In 1929, Canessa died, and a year later, in the last week of March 1930, the American Art Association and Andersen Galleries organized a sale of his collection in New York. A catalog was released for the sale, where under #120 material dated to the 6th century BCE and called the "Maikop treasure" was published [Canessa 1930]. The catalogue prefaced the incomplete list of items (given alphabetically, from A to P), with a statement that the objects had been found in the Kuban region in the Caucasus in 1912, while the Foreword, which emphasized the most notable materials, explained that the "famous 'Maikop treasure' (#120), [had been] unearthed at the excavations in Scythia during 1912" [Ibid., Foreword, Classical Antiquities section]. The previously mentioned silver cup (listed here under the letter "0") was defined in this catalogue as Sassanian [Ibid.].

In comparing these four catalogs (1915, 1917, 1919, and 1930), it is impossible not to note the low level of scholarship evident in the characterization of the material that interests us. After all, these catalogs had come out after the publication of Minns' *Scythians and Greeks*, not to mention the publications in Russian and German, and it is surprising that neither Canessa himself nor the American Art Association (publishers of the 1930 catalog) used the numerous opportunities for making the chronology of the collection offered for sale more exact.

The museum of the University of Pennsylvania approached the acquisition of the collection published in 1930 as the "Maikop treasure" in a completely different manner. The museum consulted the most important world specialist of ancient history, art, and archeology of southeastern Europe of the first millennium BCE, M.I. Rostovtzeff, who had worked as a professor at Yale University since 1925. A brilliant scholar of Classical Greek and Roman antiquities, Rostovtzeff had received world recognition as the best specialist in the area of Scytho-Sarmathian archeology. His monographs have become classics of world archeology and art history, having received the highest regard of their contemporaries, and they remain relevant today.[10] And it was Rostovtzeff who, after familiarizing himself with the Berlin part of the collection, had repudiated all efforts to connect the Scythian materials offered for sale with the Chmurev barrow, defining with absolute precision the Kuban origins of the objects that he had examined, manufactured in the Scythian animal style .

The archive of the University of Pennsylvania Museum has preserved five hand-written letters from Rostovtzeff related to his participation as the chief expert in the question of the acquisition of the Canessa collection by the museum.

Honoring the museum's request, Rostovtzeff and a colleague from the museum, Helen Fernald, arrived in New York one week before the day of the auction, and visited the Andersen Galleries, where they examined the materials of lot #120, named the "Maikop treasure." Earlier, however, in a March 12, 1930 letter to the director of the museum, Horace H.F. Jayne, Rostovtzeff had already noted the variety and the importance of the collection based on its description in the sale catalog, and had recommended that the museum buy it. In a March 24, 1930 letter, the secretary of the museum, Jane M. McHugh, asked Rostovtzeff to send the museum an official memorandum regarding the value of the planned acquisition. It remains unknown when Rostovtzeff sent his memorandum (the document lacks a date — A.L.), but it must have been between the 25th and the 28th of March, 1930, as the auction happened on March 29.

Its brevity and precision, clarity and exactitude differentiate this document that defined the fate of this outstanding collection of Black Sea area antiquities.

I feel it is necessary to give the full text of this document [Transcription from original in the Museum Archives]:

The Museum of the University
of Pennsylvania
Philadelphia
Memorandum

The inspection of the Scytho-Sarmatian antiquities of the collection Canessa, which I carried out with Miss Helen E. Fernald in New York at the Anderson Galleries gave following results.

1) The so-called Maikop find is not one find but consists of various sets which belong to various times. All of these sets belong however to the circle of the Asiatic so-called Nomadic civilisations. The sets, as far as I can see, are the following.

A. Set of Scythian antiquities of the early Vth cent. B.C. It is a part of a find which was probably made in the region of the river Kuban (N. Caucasus) in 1912 and of which the largest part (the most important articles) came to Berlin (Antiquarium) and another (small) part to the Metropolitan Museum. The objects in the Canessa collection are interesting and give a good idea of the Scythian burials of the Vth cent.

B. Set of miscellaneous Scythian antiquities of the IV-IIIrd cent. B.C. with a slight admixture of still later things. Representative, and of little value.

C. Objects from a Sarmatian burial probably from N. Caucasus and of the Ist-IInd cent. A.D. Interesting and late. Especially good is a bronze fibula plated with gold.

D. A silver bowl and some parts of a bridle of a late grave, probably of the time of the Avars or still later (VII-VIII cent. is just a guess). Rare, interesting and representative.

2) As far as I was able to see all the Scytho-Sarmatian objects are genuine. I saw no forgeries among them.

Very truly yours
M. Rostovtzeff

The University of Pennsylvania museum had thanked Rostovtzeff numerous times for his work, and invited him to work at the museum, but only on January 30th, 1932 was he able to stop for a day in Philadelphia on the way from Washington D.C. to Connecticut and work with the "Maikop treasure."

The result of this work was a more detailed letter from Rostovtzeff concerning the objects that constitute the Maikop collection. The undated letter was sent to the museum in the first week of February 1932, since in a letter dated February 9, the director of the museum, Dr. Jayne, thanks Rostovtzeff for his help in defining the objects in the "Maikop collection." In his last letter, Rostovtzeff came to the conclusion, after a more thorough acquaintance with the "Maikop collection," that a number of bronze wares undoubtedly originating in the Kuban region corresponds to the Scythian gold of 6th-5th centuries BCE. At the same time, he does not dare attribute to the same part of the collection certain other items, which, as it turned out later, were from the Bronze Age or the pre-Scythian times. In comparing the gold objects from the Scythian era with one another, Rostovtseff notes that some of the objects have parallels with objects from the Crimea and the banks of the Dnieper River. He does not exclude the possibility of their origin in the Kuban region, but, taking into account the differences in the colors of the gold, some technological methods of manufacture, and the thickness of the plaques, he leans towards the possibility that these items constituted their own group.

Fig. 5. Gold diadem (Two fragments) decorated with filigree and enamel. L.8.1 and 5.7 cm. 5th century BCE.

Rostovtzeff further emphasizes a relatively small group of Sarmathian objects, noting the strings of beads that belong to that and earlier periods. Taking into account the presence among the beads of some Egyptian scarabs and figures of recumbent lions, he advises asking for a consultation from Egyptologists. The third part of the material consists of medieval objects, which Rostovtzeff, not being a specialist, declines to characterize.

In conclusion, Rostovtzeff expresses his readiness to publish the Scythian and Sarmathian objects if the relevant photographs are sent to him.[11]

It is unclear from his later letters to the museum whether he had received the requested

Fig. 6. Gold earrings decorated with filigree and granulation. H. 2.6 cm. 5th c. BCE.

photographs and whether he wrote the planned article (even if it were written, it remained unpublished — A.L.).

Returning to the time immediately preceding the auction of the Canessa collection, let us note that during the March 21, 1930 meeting of the Board of Managers of the Museum, the possible acquisition of the Scytho-Sarmatian collection was discussed. A member of the Board since 1916, a well-known businessman and benefactor, William Hinckle Smith, decided to buy the Maikop collection for the museum. This present to the Museum seems especially generous considering that it was offered at the time of the Great Depression, when numerous banks and companies went bankrupt and the economic situation was not favorable to such impressive donations.

It appears that we will never know why the museum, not expressing interest in buying Canessa's collection earlier, now decided to acquire it during the Great Depression, or why Smith supported the museum's decision. I think, however, that the terrible warning by Andersen Galleries that it might sell the Maikop collection (lot #120) piece by piece played a significant role in the museum's decision [Canessa 1930, Lot no. 120]. Here was a real chance that the treasure would cease to exist as such, having been divided among many private collections of antiquities. Considering the tastes of the collectors at the time and the principles of collection creation, no doubt house wares and work tools made of bronze and iron, a third of the collection, would have simply disappeared. I think generations of professional and amateur lovers of ancient history ought to be grateful to Mr. Smith and the University Museum for saving this magnificent collection of antiquities from southern Russia. The importance of the Pennsylvania acquisition increases many times when it is understood that this is at once the only large archeological collection from Eastern Europe in North America as well as a part of the world's largest collection (outside of Russia) that describes the material and spiritual culture of tribes inhabiting the steppes of the northern Black Sea area and the foothills region of the northwestern Caucasus for 4500 years, from the 3rd millennium BCE to approximately 1400 CE.

More than a hundred years ago Merle de Massoneau had begun amassing the collection that only in the 1930's found its permanent owners. The museums of Berlin, New York, and the University of Pennsylvania, as well as Cologne became the owners of the largest collection of antiquities from Eastern Europe outside of Russia. Many revolutions had now died down, two world wars had passed, the Soviet Union had appeared and disappeared, and the Russia free of Communism returned to the world community. Nazism was destroyed in Germany, which after a forty year division became one again and entered the united Europe. The objects created by generations past and saved by the museums for future ones had become mute witnesses of modern history. Unfortunately, the storms of history did not spare the objects themselves. In particular, many rich finds from royal Scythian barrows (Aleksandropol, Chmurev, Mordvinovskii) that had been preserved in the Kharkov Museum of History disappeared during the Second World War. I had had the opportunity to work with many objects damaged by fire in the same war in the museums of Ukraine and Germany. I was truly happy when in 1989, during my first visit to the Berlin Museum's Prehistory Department, I saw some Bronze Age objects that before the war had been kept in the Kherson museum of local history. Thanks to the kindness and collaboration of the scholars from Berlin, these objects bought by the museum from a private party had been returned to the Kherson museum by the early 1990's.

During the course of my work with the Berlin part of the Maikop collection, I encountered again the consequences of the Second World War. The reader already knows that some of the objects preserved by two departments of the Berlin Museum had been damaged by fire, while some others were broken and survived in fragments, and still others disappeared altogether. Happily,

Fig. 7. Gold bracelet decorated with rams' heads (one broken) on the fittings. Diameter 7 cm. 5th c. BCE.

both departments had inventory books, compiled respectively in 1907 and 1913. These professional books included the objects' inventory numbers, their brief descriptions, including their dimensions, and most importantly sketches of these objects, the quality of which can be ascertained by comparison with actual surviving items.

In this manner, because of their descriptions in the inventory books, the hope of recovering these objects still exists. The first step in this necessary direction is the corresponding publication of these materials using the archival information, not only the descriptions and sketches but also surviving photographs and negatives. Naturally, the catalogue of the proposed publication of the Maikop collection would include all information known to me regarding the missing objects along with their inventory sketches and photographs. I hope such a publication would become the property of many specialists and amateurs of the museums in the Old and the New Worlds, of major auction houses, and relatively small antique galleries and stores. After all, the very existence of such a publication would not only return a missing archeological source to world history, but also fulfill a fiscal function important to all in the museum profession: wherever these objects appear, people must know they are being sought, that they had been stolen during the Second World War and must be returned to the rightful owners, the Berlin Museum's Departments of Prehistory and Classics.

It is said that wars are not over until the last soldier is buried. I would like to add: and not until the monuments of material and spiritual culture of the past, ones that belong to all of humanity, are returned to museums from which they were stolen.

I think that returning stolen art treasures is an important moral and ethical problem of modern times, one that must be addressed by organizations such as UNESCO as well as by the scientific and cultural communities of the world. I am an optimist, and I have some reasons for being one. Think, my dear reader, how we could hope that after the Second World War the world could see again, for example, treasures brought by Schliemann from legendary Troy. With efforts by the world community it has happened already [Tolstikov and Treister 1996]. Similarly, a day will come when we will discover that items that had disappeared from de Massoneau's collection are found! The proposed book will help this process; that reason alone makes it worth writing and publishing. And so I would like to hope that the introduction of the world's largest collection of antiquities from the northern Black Sea area, a collection that is virtually unknown to specialists in Russia, Ukraine, and Georgia, and to all who are somehow connected to the study of civilizations of the Eastern Mediterranean, will be a positive impulse for a thoughtful analysis of this multifaceted archaeological source.

Now this book is ready. We in the University of Pennsylvania are waiting for sponsors' and donors' help which we need for publication of "The Maikop Treasure."

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Notes

1. Referencing the letter by D. von Bothmers (December 12, 1961), the literature contains a mistaken report that de Massoneau had accumulated his collection over five years (1890-1895) — see Greifenhagen 1970-1975, Vol. I, p. 41; see also Damm 1988 , p. 65). At the same time, the latter article (p. 67) notes that among early medieval materials from the de Massoneau collection, the most important are those discovered in Kerch, in the tomb opened on May 24, 1904. Clearly, de Massoneau continued to enlarge his collection at least as late as the second half of 1904.

2. Archive of the Berlin Museum für Vor- und Frühgeschichte, #1128/07 (translation from German mine — A.L.).

3. Information kindly provided me by the keeper of the collection of de Massoneau, Dr. Gertrud Platz (her letter to me of August 21, 2002).

4. Catalogue 1922. Objects offered on sale originated in eastern Crimea, the Taman Peninsula and the neighboring Kuban regions.

5. Archive of the Metropolitan Museum of Art, New York, Letter no. 58 of John Marshall.

6. Antiken Abteilung Staatliche Museen, Berlin, Inventory Book, p. 35 (Protocol of July 8, 1913).

7. If we are talking about medieval items, we should remember that at the end of 1935 and beginning of 1936, 673 items were sold (according to Diergardt's will) to Cologne's Römisch-Germanisches Museum. Two hundred of them, well preserved after the war, became the theme of a special publication. All these items belong to the time of the great migrations and are dated to the 4th-6th centuries CE. See Damm 1988, pp. 65-21O.

8. Shmidt 1927, pl. 9. Two objects published here do not belong to the de Massoneau collection, namely a plaque in the shape of a moose (inv.#7036), from the P. Mavrogordato collection, and a part of some bimetallic (bronze, iron) object in the shape of a horse leg (inv.#5826), from the collection of R. Virhov.

9. For Canessa's activities in the world antiques market, see Catalogue 1915, Introduction by Prof. Arduino Colasanti.

10. His important books include *Antichnaia dekorativnaia zhivopis' na Iuge Rossii* (1914), *Ellinstvo i Iranstvo na Iuge Rossii* (1918) [his *Iranians and Greeks in South Russia* is a separate work and not merely a translation of this into English — ed.], *Skifiia i Bospor* (1925), and *The Animal Style in South Russia and China* (I929). For a complete listing of Rostovtzeff's works concerning the study of southern Russia, see SKIFIKA 1993, pp.9-11.

11. Archive of the University of Pennsylvania Museum of Archaeology and Anthropology, Letter of M. I. Rostovtzeff, undated, early February 1932.

In Celebration of Aleksandr Leskov

Aleksandr Naymark*
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Professor Aleksandr Leskov is known in Ukrainian and Russian archaeology as "Sasha the Golden Hand." Indeed, gold jewelry and toreutic from his excavations in the Crimea and south Ukrainian steppes constitute a significant part of the collection in the Ukrainian Museum of National Treasures in Kiev, while his excavations on the northwestern Caucasus (Adygeia) formed the core of the "Golden Chamber" in the Moscow Museum of Oriental Art. Leskov is undoubtedly responsible for more discoveries of ancient gold than any living Scythian archaeologist.

Given that the odds of finding true treasures in archaeological excavations are about the same as for winning a major lottery jackpot, everybody unavoidably asks: what is the secret of Leskov's never-fading luck? The truth is, there are no miracles which lead to buried treasure. At least three serious factors have always significantly increased the probability of Leskov's success.

The first is his organizational ability which enables him to marshal substantial resources effectively. Excavation of a major Scythian barrow involves obtaining sizeable funding and supplies, interacting with multiple institutions, and coordinating the daily work of dozens, if not hundreds, of people. Leskov manages such undertakings with an iron will and in turn inspires devotion from those he is supervising. During the Adygeia excavation seasons of the 1980s, I remember him repeating again and again: "You have only one excavation season in your life. It is this very one. The next season will be different and will take place in a different year. You have to do the maximum today." Doing the maximum of itself should maximize the results.

Yet his success requires a second talent, the ability to select the best excavation site through consideration of all the geographic, topographic and historiographic data about the steppes. For example, his selection of Adygeia for the excavations in the 1980s began from his understanding that the major passes through Caucasian mountains were the shortest route to the rich coastal areas of the Black Sea and further to the centers of Near Eastern civilizations in the northwestern Caucasus. These considerations were supported by his analysis of a great number of exciting discoveries in the area ranging from the early Bronze Age kurgans like the Maikop barrow to the burials of the Belorechenskaia culture filled with objects brought by the Levantine trade of the 14th and 15th centuries CE. The last link in the logical chain leading to Leskov's discovery of the now famous Uliap barrow field was his knowledge of the collection of the local museum - a cauldron delivered there by a tractorist from Uliap field belonged to the type which, as Leskov knew, could be found only in the richest of Scythian burials.

The third and most important factor is Leskov's personal philosophy: "The archaeology of the steppes has its own dialectic — only quantity brings quality there." In other words, only large, long-term excavations requiring years and years of self-discipline and patience can bring major results. To test this conclusion, one would need, like Leskov, to excavate more than 400 barrows with thousands of graves, the lion's share of them belonging to the Bronze Age period. In fact, Leskov's most important books are not devoted to his spectacular Scythian finds but rather deal with the less impressive but equally interesting period of the late Bronze Age and the transition to the Early Iron Age in the steppes.

In short, the secret of Leskov's success is prosaic: his dedication and focus, his ability to mobilize knowledge, and hard work. What shaped this man's strong personality? Born in Kharkov, Ukraine, on 19 May 1933, Aleksandr lost his father to Stalin's purges at age four and grew up with his mother partially in Ukraine and partially (during the five years of World War II) in evacuation in Central Asia and Azerbaijan. His interest in ancient art and archaeology goes back to the age of thirteen — as a sixth-grader he came across a stack of books on the ancient Orient while visiting a cousin studying history at Baku University. This interest quickly developed into a passion and even pushed into second place chess, where Leskov already showed great promise by earning "master candidate" status at the age of 15. (To this day he still can play blindfolded three matches simultaneously.) His lack of interest in natural sciences almost turned Leskov's high school studies into a disaster, but fortunately the grades on the high school diploma were not the major criterion for university admission at that time. Entrance examinations were more important and, given Leskov's field of specialization, the ones that counted were those in humanities, i.e. literature, history and languages.

Leskov and his associates at the Uliap excavation.

The archaeological expedition of Kharkov University, headed by the then young Boris Andreevich Shramko, served as Leskov's first school of field work. It was during a visit to this expedition, that Professor Bibikov, Director of the Institute of Archaeology of the Ukrainian Academy of Sciences, noted the bright student and invited him to apply for graduate school in Kiev. An early doctorate in 1961, the publication of the first book in 1965, and major success in field work promised Leskov a great career. His image as a very promising young scholar was certainly reinforced by the epic sum of one million rubles (a worker's daily salary being 1.59 rubles), which he squeezed from the Ministery of Melioration of the USSR for the excavation of endangered monuments in Kherson province. On the basis of this financial support, the first Soviet department of contract archaeology was formed in the Institute of Archaeology of the Ukrainian Academy of Sciences. The following decade was a busy time filled with huge field projects, a large number of publications, honorable official appointments such as the acting editorship of the three-volume *Archaeology of Ukraine* project, and even some recognition beyond the Iron Curtain. For example he was invited to consult on the volume *The First Horsemen* in the Time-Life Books series, and a special number of *Antike Welt* was devoted to Leskov's work on Scythian barrows. His discoveries even won him an important state prize.

Yet, in the weird, unstable political climate of the Brezhnev "Era of Stagnation" almost anything could be pregnant with unexpected trouble. At a New Year's party held in the Kiev Archaeology Institute in 1972, four members of Leskov's Kherson archaeological team sang a song with semi-political Russian words to the tune of the famous "Sholom Aleyhem." Exposure of the "Zionists" followed, and since their chief Leskov tried to rescue them, he was accused of failing to provide sufficient "political guidance" in his division. Note was taken of the fact that Leskov's expedition did not have a single member of the Communist Party in it. After a short delay, Leskov was fired on 20 April 1973. As if it were not enough, this measure was followed by an unofficial moratorium on any publications by Leskov and even on any reference to his work in printed matter produced in Ukraine. For the next three months Leskov was unemployed and then was "sent" to the institute of cybernetics of the Ukrainian Academy of Sciences, where he was to take part in the development of the keyword vocabulary for a computer search system being designed for archaeological databases. This "appointment" lasted for a year and a half and very much resembled involuntary confinement intended to prevent his having any connection with real archaeology.

No one at all familiar with Leskov would expect him to have accepted this defeat. He cut his losses and used this time to complete the gigantic text of his habilitation dissertation "The Pre-Scythian Period in Southern Ukraine," which he submitted for consideration to the Moscow Institute of Archaeology of the Academy of Sciences of the USSR. The Department of Scythian and Sarmatian Archaeology of this leading institution deemed this work ready and assigned the date for public defense. Yet the story of this dissertation turned into one of the most famous political scandals in the Soviet archaeology of the 1970s. The so-called external review from the

Department of Archaeology of Moscow University was completely positive as were the examination reviews provided by the three major specialists in the field employed in the process of the defense as the official opponents: Academician and Director of the State Hermitage Museum, B.B. Piotrovskii; the Director of the Moscow Department of Scythian and Sarmatian Archaeology, Professor K.F. Smirnov; and the Head of the Department of Scythian Archaeology at the Kiev Institute of Archaeology of the Ukrainina Academy of Sciences, Dr. A.I. Terenozhkin. There were a number of unsolicited laudatory external reviews from leading specialists such as Professors A. P. Griaznov and I. M. D"iakonov. No objections were raised in the course of the discussion. And yet, when the ballot box was opened, one third of the balls turned out to be black. This meant that the dissertation had failed. This unprecedented discrepancy between the publicly-asserted quality of the dissertation and the secret vote meant only one thing: the small circle of committee members closely associated with the Director of the Moscow Institute of Archaeology, Boris Rybakov, sadly famous for his anti-Semitism, unanimously cast the negative vote. Indeed, Rybakov was known to say publicly about Leskov: "So long as I am alive, this 'American' will never work in an institution of the Academy of Sciences." Most disturbing was the thought that, even with this pre-determined negative part of the vote, it could have come out differently if all members of the committee had been present on that day. In fact, several people, including Professor Otto Bader, were so sure that the quality of the work would result in a positive vote that they did not even bother to attend the defense. The majority of the committee was appalled and drafted a petition, threatening to turn this case into the beginning of an academic "war." Leskov, however, chose another approach. Within the next several months he reworked 60% of the text (as the official rules required for the re-defense) and in less than in a year brought his dissertation to the same committee again. This time even Rybakov wanted to avoid confrontation and sent an unofficial message to Leskov asking him to submit the work to another committee (it could also be done at Moscow University, or in the Leningrad or Novosibirsk Divisions of the Institute of Archaeology), but Leskov refused to do so. This second time the entire archaeological community was alerted and all the members of the habilitation dissertation committee were present. As a result, there were enough positive votes to pass the dissertation, although there was exactly the same number of black balls (eight) in the box as in the first case.

Although victorious, Leskov found himself in a difficult situation. Primarily a field archaeologist by vocation, he was confined to the editorial department in the Museum of the History of Religion and Atheism in Leningrad. An optimist, he kept hoping for the best. Meanwhile he continued publishing — four of his books came out during the following four years.

"Stay ready and opportunity will come,"says Russian folk wisdom. By the very end of the 1970s, it became clear even to some members of the governmental elite that the brainless melioration policies and the unrealistic "plans" requiring exceedingly high production levels from collective farms had led to the mass destruction of archaeological monuments, especially in the agricultural regions of the eastern part of the Soviet Union. In response to this problem a government rescript was issued in 1980 leading to the creation of a special archaeological department in the Moscow Museum of Oriental Art. That is when somebody in the administration of the Ministry of Culture remembered about Leskov, who was offered the opportunity to head the new venture.

Several successful excavation seasons in the Northern Caucasus followed. Among the discoveries were stunningly interesting archaeological monuments — the first Scythian sanctuaries of the type described by Herodotus. As if this were not enough, they were (quite in Leskov's tradition) full of rich finds. The 1982 season alone yielded almost a thousand objects of precious metals, among them the now famous Uliap silver rhyton, an amazing sculpture of the High Classical period. This looked like one of the miracles which the Soviet bureaucracy always expected but never really achieved — a governmental decision and the allocation of modest funds had immediately brought sensational results. Stunned by this, the State Committee for Science assigned huge funds to the archaeological work of the museum, which allowed Leskov to hire new people, eventually turning the museum's Department of Ancient Art and Material Culture into the second largest archaeological institution in Moscow. As a result several more excavation projects in the Northern Caucasus were started, and the work of the institution expanded into Central Asia and Siberia. The finds of Leskov's expedition attracted attention in different countries, and a traveling exhibition of them began to make the rounds of the world's capitals. This coincided with a time of great hopes — Gorbachev started the *Perestroika* process, allowing such politically dubious figures as Leskov to travel and even receive

temporary appointments abroad. Within the next decade Leskov held a number of honorary fellowships in all kinds of European institutions and short term teaching positions in several major European universities.

It was in 1990 at the height of all these activities when, after being a member of Leskov's team and a personal friend for eight years, I notified him about my plans to emigrate to the United States. He was not happy with the fact, but merely said something which I believe was a part of his credo: "An archaeologist should be close to the land, while by leaving the country you cut these ties." Thus it was quite a surprise when six years after my departure in the following year, I received a call from the new immigrant Aleksandr Leskov. A few months later, Leskov came with lectures to Bloomington, and, sitting in my dining room, told me the sad story of everything coming to a halt in Russia, about the same party functionaries controlling the ball, albeit with much less regulation by the state, about the growing corruption, about the absence of funds and lack of opportunities for field research. Surprising as his decision might seem, it was very clear why even such an optimist and practical magician as Leskov would leave the country.

As an immigrant myself I have seen many excellent scholars from the former Soviet Union come to the United States and, after struggling for some time, drop their ambitions and abandon their research. This is especially common among the people of the older generation who have but very little chance to proceed with their professional careers. Yet Leskov is the *only* one whom I personally know, who came to the USA near retirement age (he was 64!) and instead of accepting the quiet life of a retiree kept fighting for the continuation of his professional life. Many of our joint acquaintances were more than skeptical — Leskov did not even have a command of spoken English. But he studied the language and tried, and he worked and pushed. Of course there were people who understood the situation, saw his efforts and helped. Leskov told me many times how grateful he is to Professors David Stronach, Philip Kohl and Holly Pittman, without whose encouragement he would have lost the faith.

It is already the fourth year that Leskov has been hosted by the Museum of Archaeology and Anthropology at the University of Pennsylvania, where he works under the auspices of Professors Donald White and Holly Pittman. Presently, he is preparing the full publication of the famous Maikop treasure, the largest collection of the ancient artefacts from the Eastern European steppes housed outside the museum collections of Russia and Ukraine, which happens to be divided among the collections of the University of Pennsylvania Museum of Archaeology and Anthropology, the State Museums of Berlin and the Metropolitan Museum of Art. In fact, he made here another most important discovery: according to him the Maikop hoard is by no means a treasure, but a private collection of the French adventurer M. A. Merle de Massoneau, which was sold in the early 20th century to different institutions and private individuals. In other words, what scholarly literature during the last century treated as one complex of finds (although not free from admixes), turns out to be a random selection of objects from various regions (Ukraine, Crimea and Northwestern Caucasus) belonging to completely different epochs from the early Bronze Age to the Medieval period!

What does Aleksandr Leskov do now that he has celebrated his 70th year? If you ask him about the essence of his present life, he will tell you that he is on a mission to increase the awareness of the ancient cultures of the Eastern Europe in the American academic community by showing the pivotal role of the steppes in the formation and development of Eurasian civilizations. Two years ago he organized the first major professional archaeological tour through the monuments and museums of Ukraine. He has recently joined the efforts of Professor Renata Holod to organizes a center of Ukrainian archaeology at the University of Pennsylvania. Among their plans are publications of scholarly and popular books devoted to the ancient cultures of the area, field projects and, of course, the training of graduate students who would in the future deal with this field of study in the USA. Part of the plan is to exchange graduate students between Ukrainian research institutions and The University of Pennsylvania.

As is always the case with Leskov, he has many other irons in the fire... One which began last year was to join an Israeli project "The Seventh Century," being developed by the Olbright Archaeological Research Institute. Following this, he spent three months studying archaeological collections in Israel and Jordan. He hopes to find material evidence testifying to the presence of nomads from the Eurasian steppes, whom the Bible and other early Middle Eastern annals mention as passing through this area in their offensive against Egypt in the seventh century.

Let us wish him good luck in these and all his future endeavors!

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*This tribute was originally written to celebrate Professor Leskov's 70th birthday in 2003.

About the Author

Born in Tashkent, **Aleksandr Naymark** received his education in archaeology and history at Tashkent and Moscow Universities. After moving to the United States in 1992, he received a Ph.D. in Central Eurasian Studies from Indiana University, his dissertation being on "Sogdiana, Its Christians and Byzantium: A Study of Artistic and Cultural Connections in Late Antiquity and the Early Middle Ages." He has participated in more than 30 excavations in Central Asia and for a time worked in the Moscow Museum of Oriental Art as its curator of Central Asian pre-Islamic art and coins. Between 1997 and 1999 he was a fellow of the German Archaeological Institute in Berlin. Dr. Naymark is currently an Assistant Professor in Art History at Hofstra University. He has published widely on early islamic art, numismatics and archaeology in Central Asia. His article on the Sogdian palace complex of Varakhsha appeared in *The Silk Road*, Vol. 1, No. 2 (2003). He may be contacted at Aleksandr. Naymark@Hofstra.edu.

Greeks, Amazons, and Archaeology

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The legends of the Amazons and their battles with the Greeks were popular subjects of ancient Greek art. Images of lone Amazons, of combat between an Amazon and a Greek hero, of general battle scenes,[2] and occasionally of more amicable meetings appear in vase painting, sculpture, and other forms of art. The earliest representation known was made about 700 BCE [Schefold 1966, pp. 24-25, plate 7b]. The subjects appeared frequently in the fifth century BCE, eventually rivaling the popularity of depictions of centaurs [*Encyclopedia Britannica* (1957)].

Did Amazons really exist? Many modern writers deem them to be mythical beings as are the satyrs and centaurs. Others believe them to be symbols of the Persian or other peoples menacing the Greek borders and colonies. Still others believe that they may have been members of matriarchal societies of the Bronze Age.

Extant ancient written records, surviving in full, in fragments, or in reference by others, also relate tales of the Amazons. Homer, the eighth century BCE Greek poet [Taplin 1986; duBois 1982, p. 33], tells in the *Iliad* of the arrival of the Amazons to aid in the defense of Troy besieged by the Greeks. Other ancient writers mention Queen Penthesilea, who led her band of female warriors to aid King Priam of Troy.[3] After her companions have been slain, she fights on valiantly, dispatching many Greeks until Achilles with a single mighty thrust of his sword kills her and her horse. In the fifth century BCE, Herodotus, the Greek historian born in Halicarnassus, wrote of the Sauromatae.[4] These nomadic people lived east of the Don river before, during, and after his lifetime. One practice occurring in his time that seemed to impress Herodotus was the participation of the women in battle alongside the men. To give credence to this warrior image, he relates the myth of the beginnings of the Sauromatians. It so happened that the Amazons, imprisoned in three Greek ships on the Black Sea, overpowered and dispatched the crews. But lacking any knowledge of sailing, they eventually drifted ashore in the Scythian lands. In the aftermath of an ensuing skirmish, the Scythians found from the corpses left on the battlefield that the intruders plundering their land were women. The warriors, in awe of their opponents' abilities, conceived a plan to enhance their own stock. They withdrew all but the youngest warriors, who were instructed to camp near the Amazons and to avoid battle. Eventually, after one chance meeting of a couple, they soon were all paired and joined camps. In time, saying "of womanly employments we know nothing" and not abiding the life of Scythian women, the Amazons chose not to join the elder Scythians and persuaded their mates to move northeastward beyond the Don river. So began the Sarmatians. All the wives continued their nomadic customs, and, wearing the same style of clothes that the men did, rode and fought alongside them.

Was Herodotus accurate in his accounts of these nomadic people? Did they give rise to the legends of the Amazons? Herodotus gathered his information about 450 BCE during his stay on the northern coast of the Black Sea at Olbia, the hub of the gold trade route between Europe and Asia [Rolle 1989, pp. 13-14; Sulimirski and Taylor 1991, pp. 583]. Much of his information came from travelers who had passed through the territories of the nomads. In modern chronology, the interval of the sixth and fifth century BCE is termed the Sauromatian period. Some population movements and cultural change characterized the Early Sarmatian period of the next two centuries. The following five or six centuries are split into the Middle and Late Sarmatian periods. Throughout these periods, there was continuity in the main customs of these ancient nomads of the Eurasian steppes, which extend from the Carpathian Mountains eastward to the Altai Mountains and have continued to be inhabited by nomads until recent times. The Sarmatians lived in the region between the Caspian Sea and the foothills of the Ural Mountains from about 600 BCE to at least 100 BCE. To the west around the northern shores of the Black Sea were the Scythians; to the south and east in what is now Kazakhstan were the Saka. The Sarmatians were in the region of convergence of eastern and western cultures. Hence, the relics of their lives are of great archaeological interest.

Is the archaeological record in accord with the ancient descriptions of these people? Since they were nomads, only their kurgans (burial mounds) can attest to their lives. In the summers of 1992 and 1993, I participated in the excavation of kurgans at Pokrovka, in the middle of the area inhabited by the Sarmatians during Herodotus' time. The findings from the area under investigation by this project should add

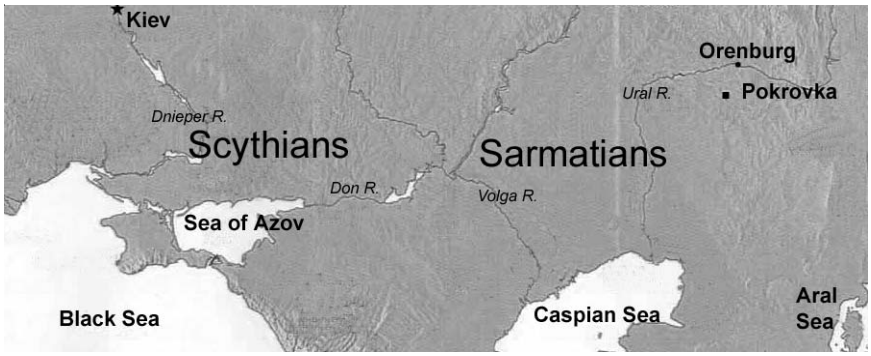

Fig. 1. Map of the steppe region, showing the location of Pokrovka.

substantially to the knowledge of these nomadic people. What follows here are some of the results which correlate with the ancient depictions of the Amazons.

The area of the excavations is in a tongue of Russian land protruding some 55 km. southward into Kazakhstan and situated about 160 km. south of Orenburg and 500 km. north of the Caspian Sea (Fig. 1). The site is named for Pokrovka, a village of about 4000 inhabitants some 6 km. to the west and the center for the state farm which manages the vast fields of wheat and corn nearby. The excavation team camped on the south bank of the Khobda river, a few kilometers from each of the two necropoleis selected for excavation in 1992 and from an additional one excavated in 1993. Due to a quirk in the boundary lines here, the north side of the river some 10 meters away is Kazakh land. In addition to the archaeologists, the excavation team included geologists, physicists, soil scientists, artists, architects, engineers, programmers, a historian, a medical doctor, and a mathematician.

The Pokrovka excavations had begun in the summer of 1991, focusing on 14 Sarmatian necropoleis surveyed in 1990 by Dr. Leonid T. Yablonsky of the Institute of Archaeology, Russian Academy of Sciences. One necropolis of these nomadic people contained dozens of burial mounds, or kurgans; another contained only one. The excavations in 1992 and 1993 were the result of the joint efforts of the Russian/American Department of the Kazakh/American Research Project whose director was Dr. Jeannine Davis-Kimball, Dr. Yablonsky of the Institute of Archaeology of the Russian Academy of Sciences and his crew, and a group of students from the Pedagogical Institute of Orenburg led by Dr. Nina L. Morgunova. The author participated as the field representative for Dr. Davis-Kimball.[5] In addition, there were other Americans present, two in 1992 and four in 1993.

Fig. 2. A large kurgan (44 m. diameter) in a wheat field (Pokrovka necropolis 3, kurgan 4).

Figure 2 shows a large kurgan in Pokrovka necropolis 3 in a wheat field as an example of the appearance of a burial mound before excavation. For training the students from the Pedagogical Institute of Orenburg, the second kurgan of Pokrovka necropolis 8 was excavated by the classical method of leaving balks along the north-south and east-west diameters (Fig. 3). The soil above the original surface as well as the ancient humus layer was removed by shovels. On most of the other kurgans because of limited time and manpower, and the large volume of soil involved, a bulldozer and a grader were utilized to remove the soil above the level of the original soil surface except for one or more

Fig. 3. A kurgan excavation showing balks along the west to east and north to south diameters.

balks left in the north to south direction. The dark colored humus layer was then removed by shoveling. The surface of the light colored soil underneath was then shaved with flat, square-ended spades to locate changes in soil color and texture that indicate the presence of burial pits within the perimeter of the kurgan.

The excavation of a pit began on one side of a line dividing the surface level of the pit in half. The resulting central wall provides a record of the stratigraphy of the soils within the pit. Usually the soil is loosened in 10- to 20-centimeter-thick layers by careful use of a nearly flat spade with a

Fig. 4. Tomb of a 40- to 45-year-old, Early Sarmatian female (necropolis 8, kurgan 1, burial 6, 1992).

pointed end. The loosened soil from each layer is removed from the pit with a shovel. After something of interest is found, the excavation proceeds with the large kitchen knife customary for the Russians or the small mason's trowel customary for the Americans. Brushes are used to sweep the loosened soil aside for subsequent removal from the pit by shoveling. Once human bone is encountered, the excavator determines the orientation and extent of the skeleton with a minimum of exposure of bone, completes the exposure of the original sides of the pit in the excavated half, and neatly shaves the central wall to reveal the soil profile. If there is any stratigraphy of interest, the profile is recorded with photography and drafting by the archaeologist and student architect, respectively. Then the excavator carefully removes the soil from the other half of the pit to the level of the skeleton. Since the skeleton and any associated artifacts must be uncovered, cleaned, photographed, drawn in situ, and then removed in one day, this final work is often postponed to the following day. It takes from two to six hours to accomplish these final tasks.

One of the most interesting burials relative to the Amazons was uncovered in tomb 6 of kurgan 1, necropolis 8. This 30 m. diameter kurgan constructed in the Bronze Age in the 11th c. BCE contained two Bronze Age, three Medieval, and eleven Early Sarmatian burials. Tomb 6 had not been disturbed. The supine skeleton lay with the skull to the south, legs extended, and the arms at the sides (Fig. 4). Southwest of the skull was a ceramic vessel with diagonal indentations across the rim; southeast of the skull was a small vase-shaped ceramic vessel, orange in color, with remnants of red pigment. Northwest of the feet were a ceramic jug with a handle and a

Fig. 5. Detail of the woman's tomb showing the iron dagger and iron arrowheads (the latter not easily distinguishable).

ceramic vessel adjacent to bones of a large animal. In addition, near the right forearm lay an iron dagger (Fig. 5); and between the legs were two iron arrowheads. From the skeletal remains, the person was identified as a woman, 40 to 45 years old. The shape of the weapons and the ceramic vessels are typical of the Early Sarmatian period of the fourth and third century BCE. Here very likely is the tomb of a warrior woman. Close by in this kurgan, burial 15 contained a 25- to 30-year-old woman with two iron arrowheads. She also had bronze earrings wrapped with gold foil, glass beads, a ceramic vessel and an iron knife resting on some animal bones. In the nearby smaller kurgan 5, tomb 2 held the remains of a 25- to 30-year-old woman with bronze and iron arrowheads and a whetstone.

There were two very interesting tombs in necropolis 2 which stretches northward along the crest of high ground toward the bluff overlooking the Khobda river and the project's campsite. The first tomb was number two of the two found in kurgan 3, a 30 m. diameter mound. The pit had a wooden cover in place and was undisturbed by robbers. The neighboring pit, in contrast, had been looted and badly disturbed. In the grave of interest, the skeleton was in the supine position with the skull to the west at a level about two meters below the ancient soil surface (Fig. 6). This was the burial of a woman of importance from the sixth century BCE. There were unarticulated camel and horse bones on the floor of the pit along the south wall. To the southwest of her skull and at the western end of the animal bones was a ceramic vessel. Near her feet were sheep bones. Near her right hand was a small ceramic vessel with red pigmentation on

Fig. 6. Tomb of a mid-sixth century BCE Sauromatian "priestess" with gold ornaments, a carved stone altar and other artifacts (necropolis 2, kurgan 3, burial 2, 1993).

its exterior. By the pit wall and northwest of the skull were an oval bronze mirror and a carved stone vessel, or altar. One corner of the rim of this altar was missing, but it was found under her left knee during the final procedures of excavation. The altar might have been broken as part of the burial rites. The bronze mirror was complete except for a missing handle. There was a band of granulation on the back near the perimeter except for a gap where the handle had been attached. The central area had some design or image obscured by corrosion.

Fig. 7. The gold panthers and conical gold pendants in situ around the neck of the "priestess."

There were numerous small pale blue-green glass beads scattered about the skeleton, possibly evidence of decorations on a garment. Three stamped gold plaques in the form of recumbent panthers were uncovered around her neck (Fig. 7). Each had perforations near the edges for attachment. One plaque was torn into three pieces. At each side of the skull was an enclosed cone of gold soldered at the apex to a gold loop with a gap. These served as earrings or pendants from a diadem. There were also some coral, carnelian, and glass beads, and five fossil shells of marine mollusks (Fig. 8). There were no weapons in this grave, but the woman was obviously an important member of this society. Women buried with altars are often classified as priestesses

Fig. 8. A display of the small artifacts from the tomb of the "priestess." The two ceramic vessels are not shown. On the left is the stone vessel with a chipped corner glued in place. The oval bronze mirror at the top center has granulation around the perimeter and a central design. Below the mirror are the gold pendants, small gold beads, gold panthers, glass and stone beads, and a carved bone. At the right are a piece of ore and fossil shells of marine mollusks.

[Jettmar 1967, p. 60] and may have performed various rites and sacrifices for their people. There were a few other artifacts in this burial including a small carved bone object.

The other tomb of special interest was in a shaft with a narrow ledge near the top for supporting a wooden cover. The supine skeleton with the skull to the southwest is that of a tall, strong man about 50 years of age from the third or second century BCE (Fig. 9). An iron dagger lay by his right hand. Nearby were residues of a scabbard and gold foil decoration. There was a gold

Fig. 9. Tomb of a warrior about 50 years old from the second or third century BCE (necropolis 2, kurgan 17, burial 2, 1993).

band that probably was part of the dagger or scabbard. The gold band looks like finely woven cloth (Fig. 10). On his left side, about 20 iron arrowheads, remnants of a quiver, and a bronze plate with traces of gilt were uncovered. This plate had been modified with two pairs of holes for attachment to the quiver with leather thongs looped through the holes. The leather is still preserved by copper salts from the corrosion of the bronze. Originally the plate was probably a belt buckle as indicated by the two holes at one end and the slot at the other. The design on this plate is the typical animal style of the nomads depicting carnivores attacking other animals, in this case a horse. There was a gold band around the right arm near the wrist. Each terminal is incised with eyes, nose, mouth, and scales to represent snake heads. Near the northeast corner of the pit, there was an orange colored ceramic jug with a handle. It was made on a potter's wheel in some workshop in middle Asia. An unusual feature of this burial is the position of the lower legs. Both had been neatly severed from the body at the knees. The reason is unknown. Perhaps this old warrior, renowned in battle over his many years of life, was felled by his enemy who severed his legs to ensure that he would never fight again in this world or the next and left him in the battlefield to die. His comrades recovered his remains and gave him a burial fitting his rank, age, and wealth. We are left to ponder his fate and wonder about the tales he must have told of his feats of combat.

Fig. 10. Artifacts from the tomb of the warrior. The orange ceramic jug is not shown.

How might we interpret the archaeological evidence? At this site near Pokrovka and elsewhere in the lands of the Sarmatians, skeletons of women buried with weapons have been uncovered. We discovered bronze and iron arrowheads in several tombs and a dagger and iron arrowheads in another. Others have found these weapons as well as spears, swords, and armor [Rolle 1989, p. 88]. In the region inhabited by the Sarmatians, about 20% of burials associated with weapons and horse harnesses were of females [Rolle 1989, p. 89]. Were these weapons actually evidence of women involved in combat; or were they possibly heirlooms, means of self-defense, or equipment for hunting on the journey to an afterlife? The dagger could be an heirloom or a weapon for self-defense but not an instrument for hunting. If it were an heirloom, it could not be very old since its style and shape are consistent with the dating of the other artifacts in the particular burial. Changes in styles and shapes generally occur in less than a century, which would mean that any relatively old items in a tomb would give conflicting ages for the burial. Arrows would not be considered for self-defense but useful for hunting in the afterlife. Perhaps they believed that they would participate in battles in the afterlife and would need their weapons of combat. The quantity of weapons in some burials indicates such a belief. In Sarmatian burials in other areas, the discovery of women with broken and pierced skulls and arrowheads embedded in bone strongly supports the view that these women did participate in battles [Rolle 1989, p. 88]. Herodotus stated that the women rode alongside the men or alone in hunting or battle [Herodotus 1956, IV, p. 239].

Did these women described by Herodotus in the fifth century BCE and found by archaeological investigations give rise to the Greek legends of the Amazons? There are some chronological difficulties. The archaeological evidence for the Sarmatians of Herodotus' time indicates that these nomads first appeared in the area in the sixth century BCE [Jettmar 1967, p. 60]. But Homer in the *Iliad* wrote of the band of Amazons that came to the aid of King Priam of Troy besieged by the Greeks [Taplin 1986]. Homer probably lived within the period from 750 to 650 BCE and was writing of events that occurred much earlier [Ibid.]. The stories had been remembered and passed on orally from generation to generation until finally put into writing. Most arguments attribute the events to the Mycenaean Age, 1400 to 1100 BCE. Finley makes a strong case for the Dark Age, 1050 to 900 BCE [Finley 1978]. The latest time that the events could have occurred would be Homer's own time [Taplin 1986]. Even if this were true, Homer probably died before the appearance of the Sauromatians, as indicated by the archaeological evidence [Jettmar 1967, p. 60]. Findings from recent excavations east of the Caspian Sea suggest that these earliest Sarmatians may have been Saka nomads whose origins have been traced to Central Asia in the eighth or possibly ninth century BCE [Yablonsky 1990, p. 292]. These dates give a closer chronological agreement with Homer's Amazons, but the area is much more remote from the Greeks. The Scythian nomads north of the Black Sea and west

of the Sarmatians also had burials of women warriors but not as commonly as the Sarmatians [Rolle 1989, p. 89]. The Scythians first appeared in the eighth or ninth century BCE according to the archaeological record [Rolle 1989, p. 132; Sulimirski and Taylor 1991, p. 561]. Scythian chronology is thus similar to that of the Saka, and, given the geographic proximity to the Greeks, contact between them and Scythians was quite likely. But the time is some centuries after the commonly accepted period of the events of the *Iliad*.

What do the images of Amazons in Greek art show us? The first known one, on a clay shield from Tiryns dated to about 700 BCE, depicts Herakles fighting Amazons [Schefold 1966, pp. 24-25, plate 7b].[6] Through much of the Classical period, they are portrayed in sculpture as buxom, sensuous females wearing clothing and bearing weapons similar to those of the Greek warriors. I would expect a woman well trained and skilled in combat to have a trim, lean figure and to dress in her native costume [See also Rolle 1989, p. 90]. Herodotus said of the women of the Sauromatae that they "dress like the men" [Herodotus 1956, IV, p. 239]. Shapiro notes that the Greek artists of the Archaic period portrayed all their adversaries in battle with the same style of dress and weaponry as worn by the Greeks [Shapiro 1983, pp. 105-114]. It is only later portrayals which show, in succession, the Amazons in dress similar to Thracian, Scythian, and Persian apparel. Thus, Greek art is of no help, especially when produced long after whatever historical events stimulated the imagery. In their art, the Greeks were interested in portraying beauty. For males, they tended to use athletes as models. For Amazons, they lacked any real models and therefore concentrated on the beauty and sensuality of their ideal female form.

There were changes in the style and subject of Greek art paralleling social and political changes. Shapiro traces the evidence of Amazons in Greek art and literature and shows the changes from Thracian to Scythian and then Persian influences in depictions of Amazons [Ibid.]. Greek literature originated some time after the first art, elaborated on the stories portrayed and may have relied on the art as the primary source of information about the Amazons. Shapiro maintains that the earliest images on vase paintings associating Amazons with Thrace and Scythia are closer to the truth than the later art and literature. The early works show the encounters of the popular mythical heroes with Amazons, first Heracles, then Achilles, and finally Theseus.

Does the origin of the word Amazon tell us anything? The *Britannica* dictionary states that the Greek root means "without breast."[7] More correctly, it means not to suckle.[8] According to ancient literature, the Amazons cauterized or mutilated the right breast of young girls to destroy its function and development because it would interfere with the drawing of the bow and throwing of the spear and would take strength from the right arm and shoulder [Serwint 1993, p. 403-422; Rolle 1989, p. 91]. Serwint states that there are no known cases in Greek art of Amazons depicted without a right breast [Serwint 1993]. She believes that this follows from the artists' striving for beauty and perfection and their abhorring any display of physical shortcomings of their subjects. She suggests that the exposure of the right breast in images in Amazons is a symbol of the missing anatomy. Alternatively, it might be to show the Greeks that they are being attacked by women.

The mythical tribes and nations of Amazons probably did not exist in reality, but there may have been bands of women which went to war for various causes. In her compilation on Amazons throughout history Salmonson notes a number of cases where women banded together to do combat for causes such as the crusades and the French Revolution [Salmonson 1991]. She also suggests that there may have been some religious centers that attracted "goddess worshiping, highly athletic women of the ancient world" and that Themiscyra, the capital of Amazonia, was such a center and did exist. Dietrich Von Bothmer has identified a scene on a Greek vase as a depiction of the gates of Themiscyra [Von Bothmer 1957, pl. 10].

Each of us carries a mental image of the Amazon of the ancient world. In the words of Jessica A. Salmonson:

> The Amazon archetype appears to be highly mutable, and easily interpreted according to the whims of subjective taste. The Amazon was an antisexual [*sic*] man hater, or she was an aggressive, demanding sex object. She served the system by emulating men, or she was a rebel expanding the meaning of femininity, a threat to patriarchy. She was a demeaning, impossible fabrication, or she was an upraising, revelatory reality. She was objectified as fearful and repellent, glamorous and appealing; a destructive and negative role model, or one that was ideal and suitable for all young girls. For many, the Amazon was a fascination, a fixation, a flirtation, to hate or to admire. [Salmonson 1991, p. x]

About the Author

James F. Vedder earned a PhD in Experimental Nuclear Physics at the University of California, Berkeley, in 1958. He retired in 1992 after a distinguished career as a research scientist for Lockheed and NASA. Since 1984 he has been involved in archaeological excavations world wide. He has published articles on experimental archaeology demonstrating how the Greeks painted precise sets of concentric circles on pots 3000 years ago and how the artisans of Çatalhöyük, Turkey, made mirrors of obsidian. He is a member of the American Physical Society, the American Geophysical Union, Sigma Xi, and the American Institute of Archaeology.

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Notes

1. This paper originated as an invited, slide-illustrated presentation for a Stanford University Continuing Studies Program class, "Greek and Roman Art," taught in autumn 1993 by the since deceased Emeritus Professor of Classics Antony Raubitschek (1912-1999). The subject was then submitted in 1994 as a report to satisfy a class requirement. This present version has incorporated some of Professor Raubitschek's comments and suggestions. I am indebted to him for his comments and keen interest in Amazons. All excavation photographs are my own.

2. The temple of Mausolus in Halicarnasus had an Amazonomachy depicted on one of the several friezes encircling the building at different levels. In 355 BCE, five sculptors were commissioned to decorate the exterior, one for each side and one for the pinnacle. On one extant fragment, the Amazon on the right with feet planted and body facing outward is attacking a Greek with one knee to the ground and shield raised to fend off the blows [Scarre 1993, p. 34.] Her chiton covers both breasts in contrast to the common practice of exposing the right breast (as we see in Fig. 11, from a different fragment of the

Fig. 11. Detail of Halicarnasus frieze showing bare-breasted Amazon.

frieze). An Amazon on the left rides bareback astride a rearing horse without saddle or reins. She is leaning around the far side of her steed's neck with her right arm raised. Her left leg, exposed to her hip, is bent at the knee and her shin is parallel to the horse's belly. Her other leg dangles down on the other side. On another fragment [Fig. 12, to which Fig. 11 attaches on the left], the Amazon on the right lunges forward with a himation streaming behind and with weapon raised above the cowering, helmeted Greek with his shield raised in defense. On the left, an Amazon on horseback is leaning toward the left and also riding bareback with left leg bent at the knee. This leg is exposed to the hip with the drape of the chiton almost exactly as on the rider in the first fragment. Her right knee can be seen over the horse's back. Amazingly, she is riding backward without saddle or reins and probably shooting an arrow. This image depicts the expert horsemanship attributed to the Amazons. We must remember that the Greeks aimed for beauty in their work and often reality suffered. For these and additional Amazon images, see Rodenwaldt 1927, pp. 428-429, 357, 434.

3. Salmonson 1991, pp. 210-212; Rolle 1989, p. 86, believes that the most informative source for Penthesilea is the poetry of Quintus of Smyrna.

4. Herodotus 1956, IV, pp. 237-239. Now these earliest tribes of Sarmatian nomads are called Sauromatians.

5. The second largest kurgan in necropolis 2 was excavated the first season (1991). In 1992, all 6 kurgans of necropolis 8 located on the left bank of the Khobda river about 5 km. east of Pokrovka and the largest kurgan of necropolis 2 were excavated. In 1993, 10 of 17 kurgans of necropolis 1, 4 km. southeast of Pokrovka, and 10 more in necropolis 2 were excavated. The work and findings through 1993 have been reported in Iablonskii 1993 (1995); Iablonskii 1994. The effort in 1994-1995 was supported by the Russian Institute of Archaeology and the Kazakh/American Research Project. Since then excavations have been continued by Dr. Yablonsky with the support of the Russian Institute of Archaeology.

6. See a photo of the shield, now in The Archaeological Museum of Nauplion, at http://www.culture.gr/2/21/211/21104m/00/lk04m047.jpg.

7. *Britannica World Language Dictionary*, Vol.1. (Chicago, 1966), p. 45.

8. Antony Raubitschek, private communication.

Fig. 12. Detail of Halicarnasus frieze with two Amazons and a Greek warrior.

Archaeological GIS in Central Asia

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The following short articles describe the current state of several projects developing archaeological applications of Geographic Information Systems (GIS) in Turkmenistan, Uzbekistan, Afghanistan, and Chinese Turkestan (Xinjiang). Taken together, it is hoped that they point to some of the potential applications of GIS in Central Asia.

Of course, these projects are just a few among many currently applying digital technologies to Silk Road studies, some of which set an outstanding standard, such as the International Dunhuang Project (http://idp.bl.uk). The Electronic Cultural Atlas Initiative (ECAI — http://ecai.org/) has even developed a pilot project to link a number of projects within a Silk Road Digital Atlas.

The use of GIS in projects such as these is sometimes viewed as simply a development of "digital cartography," but GIS is in fact much more. GIS not only allows data to be stored and represented in spatially referenced databases, along with layers of geographic information at any scale, but it enables new analytical and interpretive approaches. It is therefore hardly surprising that GIS should have become omnipresent in all fields that involve spatial information, from farming to the management of large cities and the running of armies. In the field of archaeology, where the study of spatial phenomena and geography are a fundamental part of understanding patterns in the past, GIS is rapidly becoming a standard part of the archaeologist's toolkit, whether at the scale of a single trench or across regions.

In each of the regions dealt with in the essays in this section, one of the first functions of GIS has been to bring existing material into a single place, in order to grapple with the disparate and sometimes chaotic nature of archaeological data from Central Asia. Whether research is focused on a single region, oasis, or site, the experience of delimiting data sets and treating them comprehensively requires a "bottom up" approach. Of course, GIS can be extremely useful even in this non-analytical role, compiling an "encyclopedia" of data which may not even have a specific research goal. For example, the comparisons between historical cartography and modern field observation in Uzbekistan and Turkmenistan demonstrate the massive destruction of archaeological sites which resulted from agricultural projects in the last fifty years. GIS can help to measure this destruction and to track the preservation of existing sites and assess the risks they may face from future development.

However, equally if not ultimately more powerful is the use of GIS as an analytical and interpretive tool, a role considered by many to be an intellectual watershed in applications to archaeology. Of course, the applications illustrated here are modest in comparision with work underway in other parts of the world. Nonetheless we hope that these articles will illustrate some examples of this type of application of GIS, or at least its potential. Finally, we hope that, taken together, these articles point to some directions for how GIS can bring archaeological resources together in a common platform across Central Asia.

About the Authors

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Note

1. Lewis R. Lancaster and Ruth Mostern, "A View from Cyberspace: The Silk Road Atlas of the Electronic Cultural Atlas Initiative," *Central Eurasian Studies Review,* 2/3 (2003): 2-7.

Archaeological GIS and Oasis Geography in the Tarim Basin

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The "pivot of Asia," as Lattimore called Chinese Turkestan (more prosaically the modern Xinjiang Uighur Autonomous Region), is an area where a great deal of ancient history, and especially prehistory, remains uncharted. At its center lies the Tarim Basin and the Taklamakan desert (Fig. 1), an immense and harsh landscape of sand dunes, pebble deserts, and salt flats. But along the foothills and at "terminal deltas" where rivers end in the desert, for millennia oasis settlements have flourished which were culturally and geographically tied at once to China, South Asia, western Central Asia, and the Eurasian steppe.

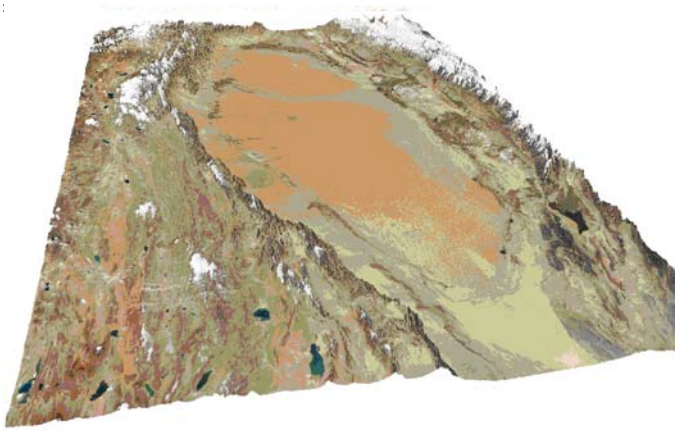

Fig. 1. A "fly-through" view of the Tarim basin, looking west (created from a true-color MODIS satellite image of the Tarim Basin [NASA, Visible Earth, http://visibleearth.nasa.gov/cgi-bin/viewrecord?23798], draped over a digital elevation model).

The exploration of the Tarim Basin at the beginning of the twentieth century was a time of spectacular discoveries, with unknown ancient languages and cultures coming to light from the inside of what had been a vast blank on the map, known almost solely from outside historical sources even when the idea of the Silk Road was first formulated. Within the last decade, research has once again begun to proceed apace, with numerous Chinese projects and joint projects with foreign researchers back on the ground in the field.[1] Here as in the other regions of Central Asia described in this section, GIS will undoubtedly play an important role in the future of establishing, interpreting, and synthesizing the archaeological record.[2] In the scope of evolving new techniques for understanding the historical geography of Central Asia, it is still only possible to sketch some directions for developing a regional archaeological GIS of this "poor sister" of the Central Asian culture areas. But at the scale of a single oasis, the Niya site, it also provides an application where the interpretive potential of GIS often alluded to has been of great utility.

Old maps in new bottles

Much of the work of early explorers of the Tarim basin remains substantive as archaeological data, but since many of those explorers were also working as the first scientific cartographers of the region, simply plotting the sites they discovered onto modern maps can be a difficult task. Geographical accuracy in their reports is often far from perfect, with vast areas still marked "unexplored," even on the beautiful set of American Army Maps published after a long lapse as the Sven Hedin *Central Asia Atlas* [Hedin 1966]. This set of maps is particularly valuable for collecting in one place the dated routes of early explorers across the entire region (Fig. 2). These routes and the locations of sites form a useful "base-map" for digitization, where in many cases specific areas can then be mapped in with greater accuracy from the original sources. For example, for Hedin's own

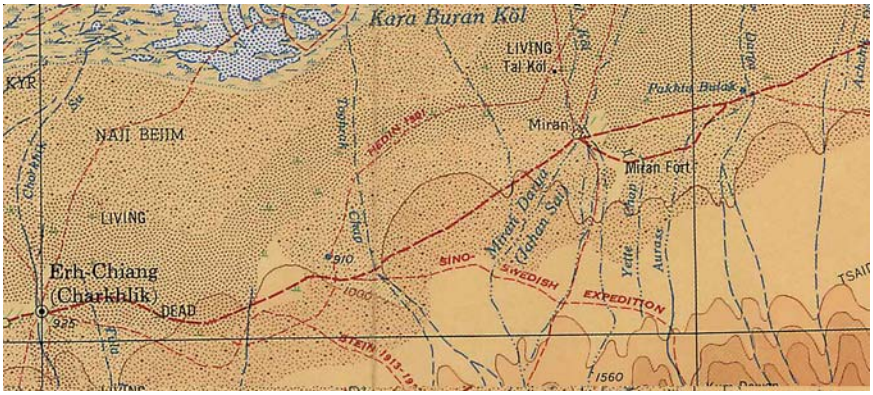

Fig. 2. A portion of a sheet from the Sven Hedin Central Asia Atlas in the area of Charkhlik, showing routes of early explorers. [After Hedin 1996].

observations, the maps published in earlier reports are often of a very large scale, being almost sketches of the landscape visible from his routes.

Once digitized, this material can be overlaid on modern cartographic data, some of the best of which are the 1:200,000 and 1:100,000 maps produced by the Russian military.[3] The quality of these maps is better than the geodata so far released by their American counterparts, the National Imagery and Mapping Agency (NIMA), but the latter are already digitized, and can be easily manipulated in a GIS with other geodata. By overlaying these different data sources, information can be compared and verified, analyzed in relation to environmental data, and used for modeling. Overlaying archaeological data on remote sensing (satellite) images, for example, offers the potential of discovering paleochannels where new sites might be discovered. The ground-penetrating radar designed by NASA's Jet Propulsion Laboratory and flown on space shuttle missions over Niya[4] provides an excellent example of this potential, since it is particularly suited to penetrating sand, and has proved its archaeological utility in the discovery of paleochannels with Paleolithic remains in the Sahara, and the ancient "incense route" city of Ubar in Oman. But in order to make such data useful, it needs to be given an exact geographical reference in relation to archaeological sites which have already been documented on the ground.

Many of these sites were first documented by the "godfather" of the archaeology of the Tarim, Sir Aurel Stein, whose work [Stein 1907, 1921, and 1928] remains an essential source, with the locations of thousands of archaeological features in quite accurate spatial contextualization of surveyed and excavated archaeological material, given the practices common in his time. What is particularly striking is that in areas where Stein and his surveyors were sometimes working in true *terra incognita*, the error in the localization of sites (common especially in longitude) are only in the range of only a few kilometers, when compared with modern field observations made with a Geographic Positioning System (GPS). Fig. 3 shows some of these geodata georeferenced with a satellite image for the area between Khotan and Keriya.

As a basis for creating a GIS database of the sites recorded by Stein in the Tarim, high resolution digitizations of the set of maps published in *Innermost Asia* (which brings together data from all three of Stein's expeditions) have been georeferenced with current geodata.[5] A point set generated from these maps serves as a reference for attaching the identification, type of site, more detailed site-plans, and most importantly, database tables of the inventories which include the provenance of all the artifacts discovered by Stein. The particular importance of attaching these data tables to loci is the ability to query and manipulate

Fig. 3. Sites of the Khotan and Keriya drainages (excluding the newly discovered sites in the ancient northern Keriya delta [Debaine-Francfort and Idriss 2001]).

data as in any other database, within a spatial reference. While many of these databases need to be developed for specific regions, and from other sources, an enormous collection of these inventories are already available in the form of the International Dunhuang Project's online database (http://www.idp.bl.uk).

Beyond "dots on the map"

The utility of GIS as a tool for interpreting archaeological material is sometimes achieved in theory more than in practice, particularly at a regional scale, and in a region surveyed as inconsistently as much of Central Asia. It will in many cases first have a role of simply providing a spatial "catalog," while building models and explaining historical and geographical patterns depends on fine-grained analysis, and especially the ability to link spatial databases with large tables of archaeological information.

One of the sites in the Tarim where this kind of fine-grained analysis can be achieved is the Niya oasis, first discovered, mapped, and excavated by Stein, and the object of Sino-Japanese field project over the past decade [Sino-Japanese 1999]. This project used digital spatial technologies extensively, making the data available in a format readily converted into a GIS. The ancient oasis is spread over hundreds of hectares at the internal delta of a river ending in sand dunes, which are so conducive to archaeological preservation that there are scores of remains of dispersed hamlets of wattle and daub structures and other well preserved landscape features (fields, orchards, vineyards, canals, pools, bridges, etc.). While there is little of the vertical stratigraphy typical of Central Asia archaeological mounds, recent discoveries of remains of late Bronze Age material far out in the ancient delta attest to the important aspect of horizontal stratigraphy of the oasis, which is particularly suited to spatial analysis (Fig. 4).

Niya is exceptional not only for a degree of preservation of an ancient landscape, but for the discovery of hundreds of 3rd-4th c. CE wooden administrative tablets dispersed at settlements as far as 20 kilometers apart across the oasis. These texts (letters, legal documents, contracts, tax lists, etc.), written in the Gandhari language native to what is today Pakistan and Afghanistan, contain a great deal of information on the everyday economic and social organization of the oasis.[6] Many different types of data in these documents are suited to discrete "coding" in a textual database, and GIS enables the attribute tables of these data to be linked directly to their archaeological contexts. This allows for a wide range of spatial querying, and the confrontation of textual data with models derived from the spatial analysis of archaeological material alone.

As part of the author's dissertation research, this database of textual information from the documents is being used within a GIS as a basis for the reconstruction of the organization and use of space in the ancient oasis, and to study aspects of daily life. This has made it possible to reconstruct the spatial structure of the ancient landscape in detail. For example, by analyzing texts for certain prosopographic criteria, it is possible to discover, settlement by settlement, a set of locations in the space of the oasis that can be associated with individuals in the documents. From these associations, it is possible to map the location and extent of toponyms and administrative units that cut across the textual and archaeological record, providing clues for the spatial organization of territorial

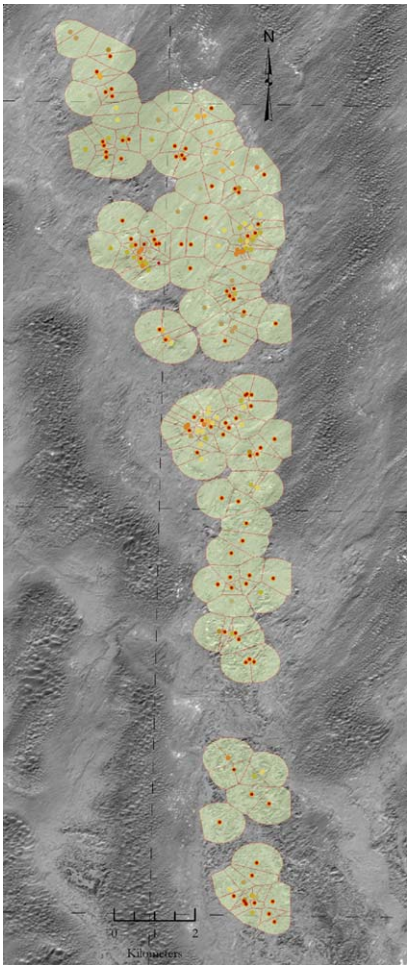

Fig. 4. GIS of the Niya oasis, incorporating digital data from the Sino-Japanese expedition, the material of Stein, and other spatial data. The "buffers" around archaeological features are used as part of one method of reconstructing the organization of space.

kinship groups, the organization and mechanisms of agricultural production and redistribution, and so on.

In a wider geographical and archaeological perspective, one goal of this research is to develop models of the organization of daily life in the early Inner Asian oasis, particularly at an economic level, which can be applied to oases across the so-called Silk Road. One direction for the application of GIS for modeling is to confront the reconstructions of the spatial organization from Niya with the

archaeological data of a similar nature from other oases of the southern Tarim, in order to understand their ecological evolution, inter-oasis relations, and similar themes. Another direction is to incorporate other textual and historical data which can be linked to the GIS — for example, economic data from later Khotanese, Bactrian, and other corpora, or the detailed demographic information provided by the "census" of the Tarim Basin oasis-states in the *Han-shu* (Hulsewé and Loewe 1979) across the last centuries BCE and first few centuries CE.

Geographically, the characterization of the region as a "pivot" throughout history has been and undoubtedly will continue to be borne out by new discoveries and interpretations of relatively local phenomena having far-reaching consequences. At the same time, because parts of the Tarim basin exemplify, in an extreme form, many of the common features of central Asian oases, it forms an excellent laboratory for building models of the evolution of settlement history with a wider importance. By uniting these sources, one can hope that GIS will provide a new means for working out some of the key geographical characteristics of the evolution of the Inner Asian oasis across time.

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Notes

1. See especially the well-illustrated volume of Debaine-Francfort and Idriss 2001, and Mei 2000.

2. From another direction, projects such as the China Historical GIS (http://www.people.fas.harvard.edu/~chgis/) could also become valuable in this respect.

3. Some excellent modern Chinese maps are also available for certain regions. Of particular interest for archaeologists are the examples included in the volume containing Debaine-Francfort 2001.

4. http://visibleearth.nasa.gov/cgi-bin/viewrecord?1337.

5. The digitized maps from *Innermost Asia* were generously provided by Susan Whitfield of the International Dunhuang Project (http://www.idp.bl.uk).

6. For a general survey of their contents, see Atwood 1991.

An Archaeological GIS of the Surkhan Darya Province (Southern Uzbekistan)

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This article presents some of the results of a long-term project undertaken by the author within the framework of the MAFOuz de Bactriane.[1] It will be focused on the use of GIS for data organisation[2] and the potential that this offers for developing and testing new models and theories.

The Surkhan Darya province (20,800 km^2) is situated in the south of Uzbekistan and borders Afghanistan, Turkmenistan and Tajikistan; most specialists consider that it forms part of the ancient region known as Bactria. In simplified terms, the province can be described as an alluvial valley, limited by the Amu Darya river to the South and surrounded by mountains on all three other sides. The main mountain passes are the "Iron Gates," on the road to Samarkand, and the low foothills, which separate it from the Kafirnigan valley and Dushanbe to the north-east. The climate is continental with mild winters, little rainfall (just over 100 mm./year in the south, but more in the north) and a long summer drought. Agriculture therefore depends to a large extent on artificial irrigation in the alluvial plain, although dry farming is practiced in the foothills. The mountains, especially to the north and west, provide excellent summer pastures and pastoralism has therefore probably always played an important role in the human ecology of the region.

For nearly 70 years, archaeological work was undertaken in the Surkhan Darya province exclusively by Soviet teams. They produced a wealth of quality data including over 2500 publications describing the excavations of sites such as Dzharkutan and Sapalli Tepe (Bronze Age), Kuchuk Tepe and Kyzyl Tepe (Iron Age), Dal'verzin Tepe, Khalchaian and Termez (Kushan period), Balalyk Tepe and Kujov Kurgan (early Middle Ages) or Budrach and Termez (Pre-Mongol period).[3] Foreign archaeological teams started working in the province in the early 1990's and since then seven foreign teams have undertaken excavations in collaboration with Uzbek teams (two Japanese, two French, one German, one Russian and one Czech) (Fig. 3). Archaeologically speaking, the Surkhan Darya province is thus one of the most thoroughly studied areas in Central Asia. It is therefore obvious that a systematic

Fig. 2. The upper Surkhan Darya plain with the Hissar Mountains in the background.

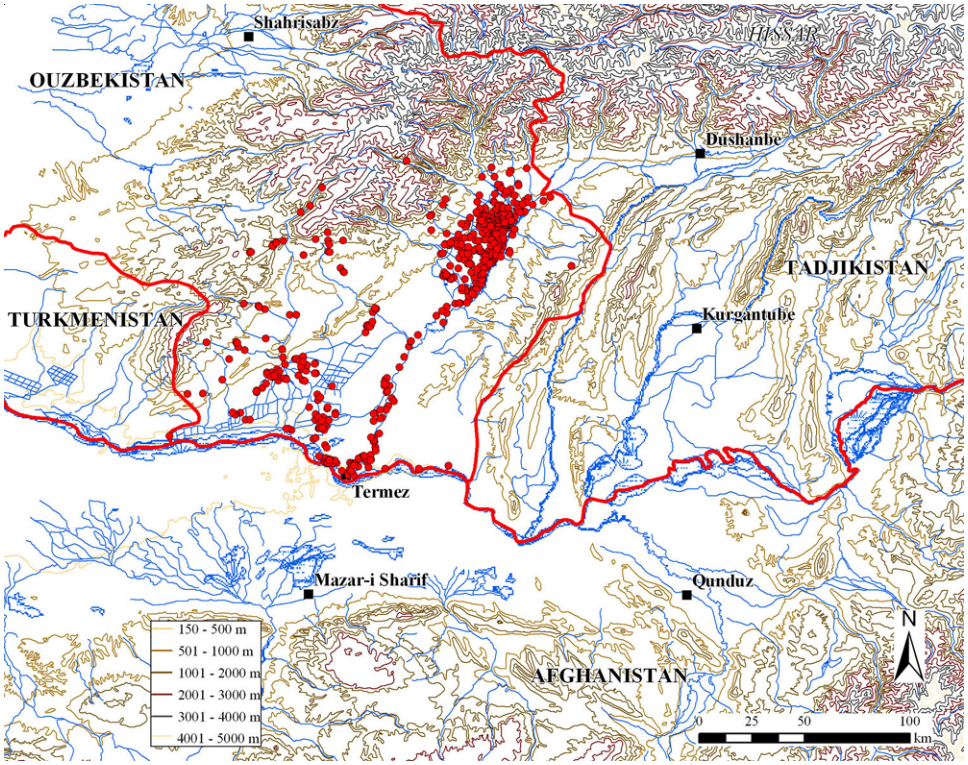

Fig. 1. A view of Bactria in GIS, with the archaeological sites of the Surkhan Darya province.

Fig.3. Archaeological work underway on the southeast angle of the citadel of of Termez. The various fortifications visible in the photo are dated from the Kushan period up to the beginning of the 13th c. (photo: MAFOuz de Bactriane).

regional survey would be meaningless had the vast amount of data from the Soviet period not been taken into account.[4]

A large number of geographical studies of the area have also been undertaken, many of which are directly relevant to landscape archaeologists. This is particularly true of landscape studies, which, in the former Soviet Union, were considered to be important enough to form an autonomous discipline (*landshaftovedenie*). The most useful publication for the Surkhan Darya province is that of Ergeshov 1974, which divides the province into fifty-six different land units, each of which is analyzed in detail by taking into account features such as the types of soil, vegetation, water availability, relief and climate in order to define potential human uses (Fig. 4).

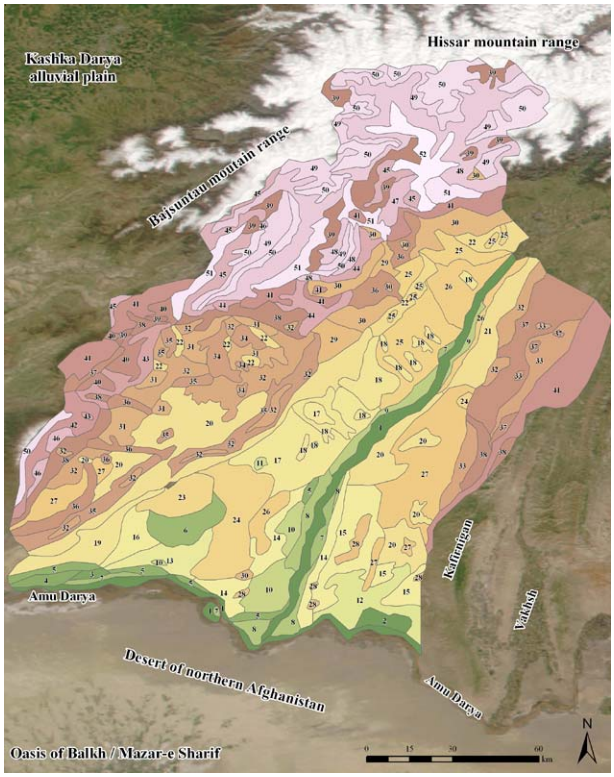

Fig. 4. The land units of the Surkhan Darya province according to Ergeshov 1974.

Finally, a number of ethnographic studies of the area exist [e.g. Karmysheva 1976]. They include descriptions of the different types of exploitation of the landscape and of the interaction between ethnic groups. As such they provide useful material which can be compared to the geographical and archaeological data.

Any serious study of the Surkhan Darya requires this vast amount of data to be organized. I have alluded to the problems associated with data management, but it is useful to underline these problems with a few examples. Most archaeological sites documented during the Soviet period were not precisely localized (for example, the only data we have for Gurgak Tepe is that it is situated "1 km. to the south of the beautiful plane tree of the kolkhoz Zhdanov," according to Pugachenkova 1966, p.29; cf. Fig. 5), and in many cases, the same archaeological site is published with different names and localizations in different articles. No complete bibliography of the province existed and most publications did not include an index. In addition to this, during the last five years, the results of new excavations have been published in various different journals and languages.

Fig. 5. The remains of a typical archaeological site in the Upper Surkhan Darya plain.

In a situation such as this, there is no miracle solution. Either you ignore the data, or you include only the most famous sites and a handful of major publications, or else, as in this case, you sort through the data systematically. A site gazetteer (based on Arshavskaia et al. 1982) was therefore developed in close collaboration with Uzbek scholars, and the 2500+ publications that concerned the area were systematically indexed.

The site database includes 680 sites, nearly all of which were localized in the field either using a GPS or by calculating the coordinates on 1:10,000 scale

maps of the early 1950's (the precision of these maps is such that they include topographical anomalies less than 30 centimeters high and 5 meters across) [Fig. 6].[5] Ironically, localizing previously known sites proved much harder than finding new sites, since it was necessary to verify all the available data. Thus, in one case, the same site was visited three times with three different archaeologists each of whom had published the site under a different name without anyone realizing that it was the same site.

The bibliography includes all the publications concerning the archaeology of the Surkhan Darya province and a list of the archives of archaeological excavations. They are systematically indexed by site, by theme and by period, with commentary. For example, the bibliography of the Kushan period site of Dal'verzin Tepe includes over 350 references with commentary, classified according to the area of excavation and/or the theme.

Once all these data were organized, the next logical step was to include them in a GIS, which contains not only all archaeological data but also:

— Scanned, georeferenced topographical maps, some of the most interesting of which are tsarist maps from the end of the 19th century (scale of about 1:50,000), German copies of Soviet maps of the 1930's (1:200,000) and Soviet topographical maps of the early 1950's (1:10,000).

— So far, vectorized data include VMap1 (based primarily on 1:250,000 scale maps) and "heads up" digitization of various features of the Upper Surkhan Darya plain based on the 1:10,000 scale maps.

— Geological, geomorphological and hydrological maps have been added, along with various tables of average temperatures, properties of the main water courses, etc. Finally each of the 56 land units defined by Ergeshov has been digitized and their descriptions systematized.

— The ethnic distribution maps produced by Karmysheva have also been vectorized; however the associated data are not yet included.

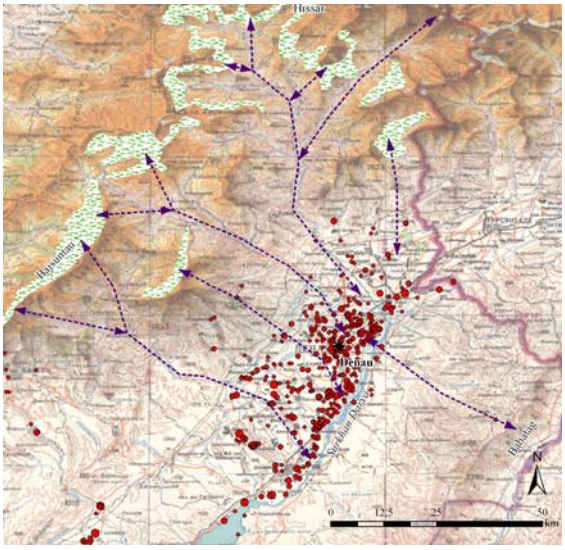

Fig. 7. Transhumant routes, pastures and archaeological sites in the northern half of the Surkhan Darya province.

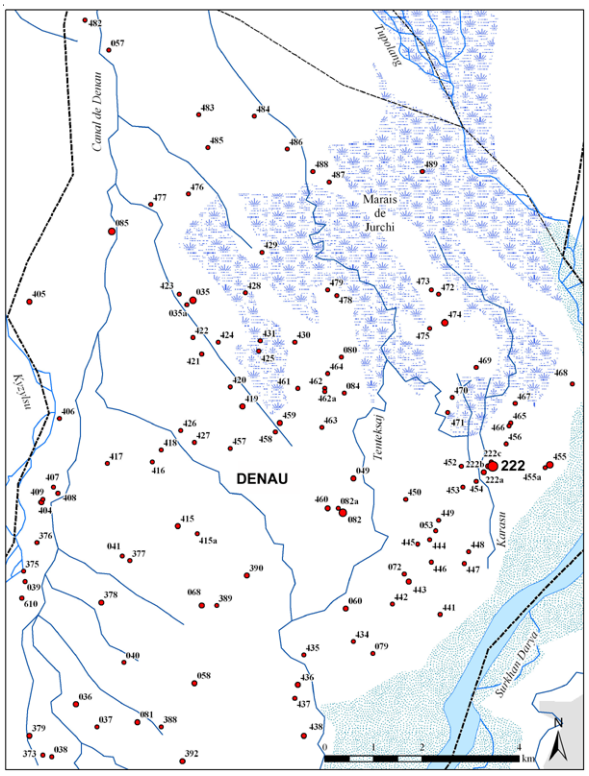

Fig. 6. Map of the archaeological sites around Denau, in the center of the Upper Surkhan Darya plain. No. 222 is Khalchaian.

Apart from giving researchers direct access to geographical, ethnographical, archaeological and historical data, the GIS thus created can be used as a powerful analytical tool in its own right. For example, Fig. 7 shows the most productive pastures during the months of July and August, along with information on the main transhumant routes and the localization of the main archaeological sites in the Upper Surkhan Darya plain. The superposition of these different layers underlines the potential importance of transhumant pastoralism within the human ecology of the Upper Surkhan Darya plain and the bias of the archaeological record towards sites associated with irrigated agriculture.

Figs. 8a and 8b give a good idea of how the GIS can be used to combine data of variable quality. In Fig. 8a the underlying raster geomorphological map and the vectorized land unit types are based on data of poor cartographic quality; however the rest of the data is taken from

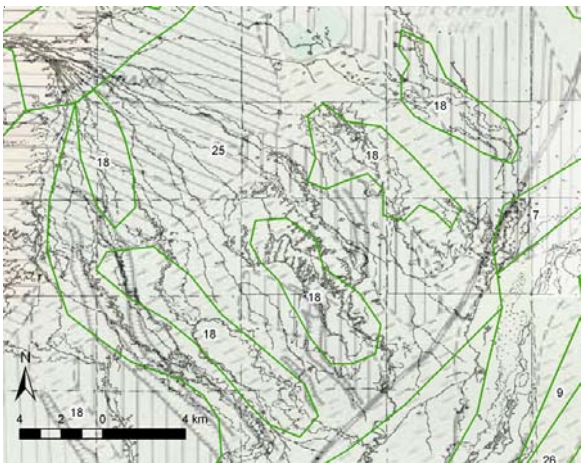

Fig. 8a. Part of the Khodzha Ipak alluvial cone showing a raster geomorphological map, land units vectorized from Ergeshov 1974 and water courses and the limits of terraces based on 1:10,000 scale maps.

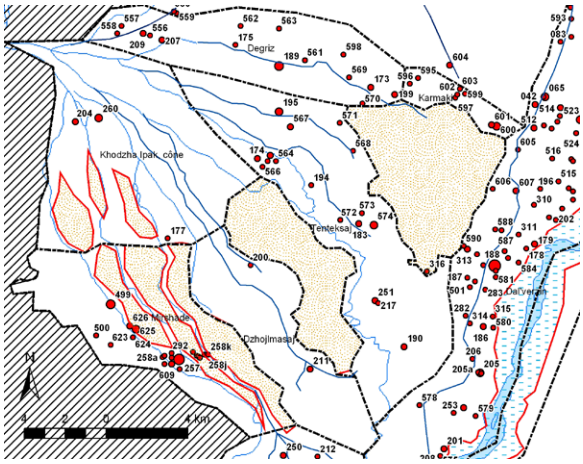

Fig. 8b. The same area, this time with redrawn land units, non-irrigable zones, floodplain, territories, water courses and archaeological sites.

1:10,000 scale maps. By combining the precision of these maps with the detailed descriptions made by Soviet geographers it is possible to create a new map, which can be used to define territories and calculate their potential for human use. The archaeological sites can thus be represented on a map that combines cartographic precision with the detailed geomorphological and landscape studies undertaken during the Soviet period (Fig. 8b).

Fig. 9 highlights the differences in settlement pattern between the Iron Age and the Kushan period. Whereas the Iron Age sites are concentrated along the small valleys of the peripheral zone of the alluvial cones, the Kushan period sites are centered on the Surkhan Darya alluvial plain around the two towns of Dal'verzin Tepe and Khalchaian.

In collaboration with scholars from the Institute of Archaeology in Samarkand, the GIS will now serve to integrate further databases. Three specific projects are underway. One is to integrate databases of all the coins found during excavations in the province, the second to include published and unpublished plans of all the sites and excavations, and the third to digitalize data from the ongoing excavations of the sites of Termez, Khajtabad and Payon Kurgan.

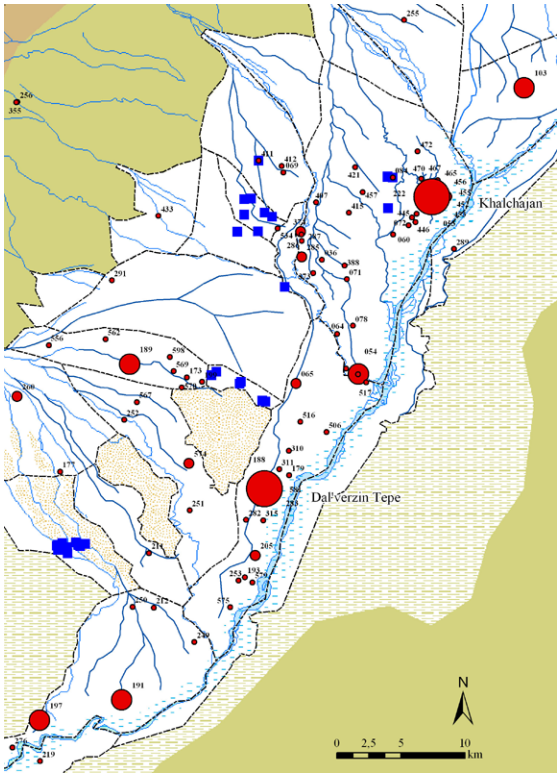

Fig. 9. Iron Age (square) and Kushan period (round) sites in the Upper Surkhan Darya plain.

GIS is particularly interesting because it can evolve so easily, not only by adding new data but also by correcting mistakes, omissions and lacunae. This makes the process of elaborating hypothesis and testing them much more fluid, especially because the results can then be integrated back into the GIS. A medium-term goal of this project, in relation to the others described in this section is to create a series of interrelated databases, to which all scholars can contribute and have access. By doing this, it should then be possible to work towards a networking of the different Central Asian GIS projects.

The dream of a Central-Asia-wide archaeological database, which various scholars formulated long before GIS existed,[6] is in many respects now technically possible. The contemporary political divisions and the nature of archaeological research in the area (data manage-

ment problems, languages, etc.) make it especially necessary. Finally the fact that relatively few scholars are currently working in Central Asia may make it easier to reach a consensus on the form that such a network should take.

Obviously, this can only succeed if all archaeologists feel that their work is correctly attributed and that it is in their interest to integrate their data into a global system. This can be achieved by clearly indicating the author of the original work (and each of the authors responsible for cataloguing and digitizing it) and by networking projects in each of the institutions that collaborates, rather than centralizing the data in one single point.

It is planned to make the GIS of the Surkhan Darya available on the Internet in the near future. In the meantime, and in line with the concept of creating an open platform, specific data concerning a given site, period or theme of the Surkhan Darya province are available on request from the author.

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Notes

1. The MAFOuz de Bactriane (Franco-Uzbek Archaeological Mission in Bactria) is directed by Pierre Leriche and Shakir Pidaev [see Leriche et al. 2001]. The team has been excavating the site of Termez since 1993, and has also worked on the sites of Payon Kurgan, Khajtabad Tepe and Karabag Tepe. The regional survey has been conducted in collaboration with Pierre Gentelle and with the help of Leonid Sverchkov. The data described in this article form the basis of a Ph.D. dissertation to be defended at the University of Paris I in January 2005. A valuable overview of the joint archaeological projects involving French teams in Central Asia may be found in *Cahiers d'Asie centrale*, No. 9 (2001): 236-302.

2. The problem of data management in the former Soviet republics of Central Asia can hardly be overstated. Back in the early 1990's, two of the foremost Russian archaeologists, Viktor Trifonov and Paul Dolukhanov, published an article in which they wrote that the lack of data management systems was making research in the Soviet Union extremely difficult:

> Data collection is a profession in itself and mere possession of information is seen as a major scientific achievement […]. It is no surprise that foreign researchers are discouraged by the difficulties they encounter when trying to find their bearings in the maze of modern Soviet archaeology. The fact that some succeed is the real surprise. [Trifonov, and Dolukhanov 1992, p.65]

The end of the Soviet system, the emergence of the newly independent republics and the appearance of foreign archaeological teams have increased the global awareness of Central Asian archaeology. However this has not made access to data any easier.

3. The best historical and archaeological overview of the Surkhan Darya province is Pugachenkova and Rtveladze 1990.

4. A systematic survey was necessary, not only because most known sites were not precisely localized, dated or associated with their environment but because much of the evidence, and in particular that of the small sites, had not been included.

5. The coordinates of some 50 sites were calculated using both methods with almost identical results. The Geographic Positioning System (GPS) ceased working in the Surkhan Darya province on the 8th of October 2001; it is now apparently working once again.

6. In the 1950's, a number of leading Soviet specialists planned to publish a Historical and Ethnographical Atlas of Central Asia, which would have included maps and catalogues of archaeological sites, ethnographical groups, specific objects, etc. [for example Litvinskii 1959]. Later Jean-Claude Gardin emphasized the need for an archaeological atlas [Gardin 1985] and laid a theoretical basis for this work in his many publications on information systems and the development of technical means of sharing data through information networks (envi-sioned in a time of punch marked cards!).

Methods and Perspectives for Ancient Settlement Studies in the Middle Zeravshan Valley

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The "Archaeological Map of the Middle Zeravshan Valley" Project, begun in 2001 [Shirinov and Tosi 2003], is a cooperation between the Institute of Archaeology of Samarkand and the Department of Archaeology of the University of Bologna. It was created and evolves with two main aims: the study of the ancient population and settlement dynamics of the Middle Zeravshan Valley (Fig.1), and the recovery, preservation and enhancing of Samarkand and its territory. This brief description will be concerned with the first.

The area around Samarkand is characterized by the existence of three "mesopotamias" (locally known as *doab* "two waters" in Persian or *jazira* "island" in Arabic). These are formed by the splitting of the Zeravshan River after its exit from the Turkestan Mountains into the Karadarya and Akdarya branches, and the two main artificial canals, the Bulungur Canal to the north and the Dargom Canal to the south. Together these four parallel trunk collectors merge their alluvial sediments and form a stretch of

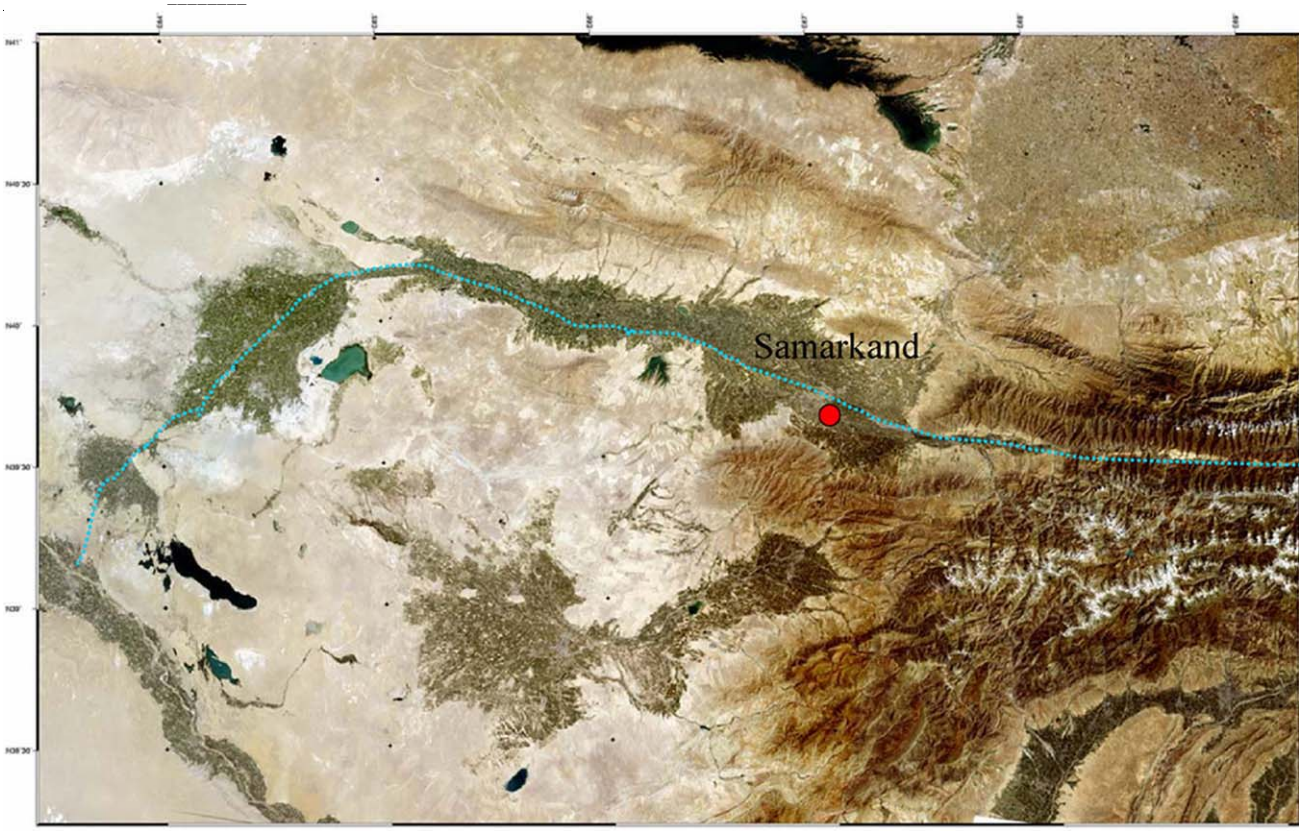

Fig. 1. The Zeravshan Valley from LANDSAT 5. The main irrigated area, corresponding to the oasis of Samarkand and Bukhara, is clearly visible.

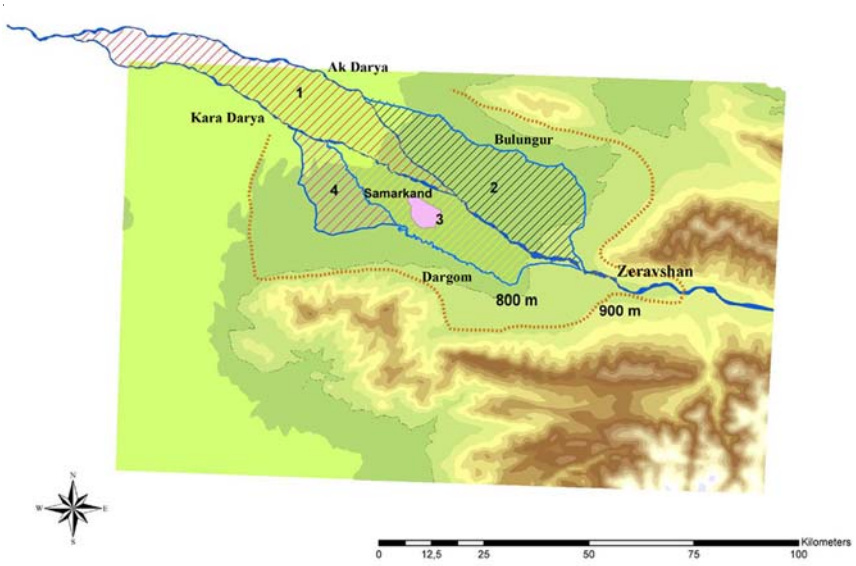

Fig. 2. The area around Samarkand (1. Doab Kara Darya - Ak Darya, 2. Doab Zeravshan - Bulungur Canal, 3. Doab Zeravshan - Dargom Canal, 4. Doab Kara Darya - Eski Angkor Canal).

irrigated farmland 40 km. wide and 100 km. long (Fig.2). This area, at the heart of the Eurasian continent, has formed the largest oasis in the whole of Central Asia at least since the middle of the first millennium BCE, comparable in size to other alluvial heartlands of civilization, like southern Iraq or Sindh.

The Middle Zeravshan Valley was subject to major, continuous and systematic development projects during the Soviet period, chiefly between the Sixties and the Eighties. The levelling of the plain, the creation of artificial terraces and the construction of new canals have destroyed or seriously affected many archaeological remains, permanently modifying the entire landscape [Zakirov 1955; Tulepbayev 1986; Dzhurakulov and Mamedov, 1986].

Today, indiscriminate soil exploitation and extensive cotton and tobacco cultivation continue to cause the loss of innumerable archaeological data. This situation has led us to develop a diversified methodological approach based on systematic surveys, the study and analysis of historical cartography, the study and analysis of satellite images and GIS data processing, analysis and modelling (Fig.3).

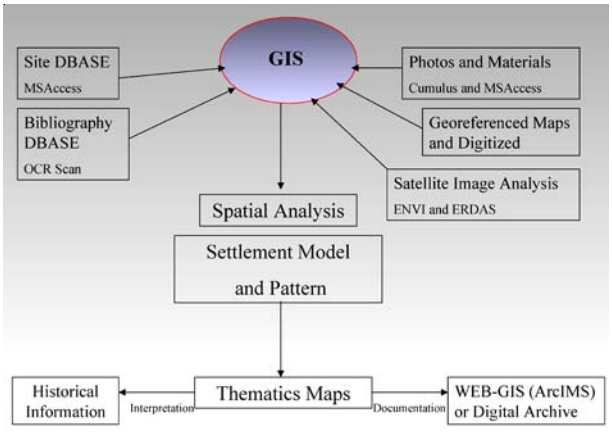

Fig. 3. Data management system.

Systematic surveys have been concentrated on the recognition and documentation of all visible structural archaeological features, in order to establish a list of preserved sites. Alluvial deposits (estimated to be several meters deep in places) and the agricultural transformations already mentioned make it difficult to undertake intensive field-walking and we have therefore limited this technique to transects or standard-areas. Each individual site was registered in digital form, with a set of different indicators that make it possible to develop distributive and relational analyses. In addition to site description and location, we also emphasized the collection of diagnostic material, and site topographical-functional information. All parameters were then compared with site explorability and preservation values, in order to establish surface datum reliability. This is a fundamental element in the attempt to compare and analyze data of different origin, typology and format. Finally, we used a centimeter-precise Total Station Geographic Positioning System (GPS) to create topographical plans of the sites (Fig. 4).

The drastic environmental changes that have affected this region, have led us to focus our research methodology on the use of historic cartography and remotely sensed satellite images. For this we were able to use material of exceptional reliability and precision, including 1:25,000 scale (with 5 meter contour lines) and 1:10,000 scale (with 1 meter contour lines) Soviet topographic maps made in 1954, where many sites are perfectly distinguishable. A standard spatial comparison between preserved sites and those obtained from the 1:10,000 cartography, from a time preceding the major agricultural development projects, shows that about 45 % of the total number of sites have been destroyed. Altimetry profiles and detailed Digital Elevation Models (DEMs) were elaborated by using 1:25,000 and 1:10,000 maps and provide

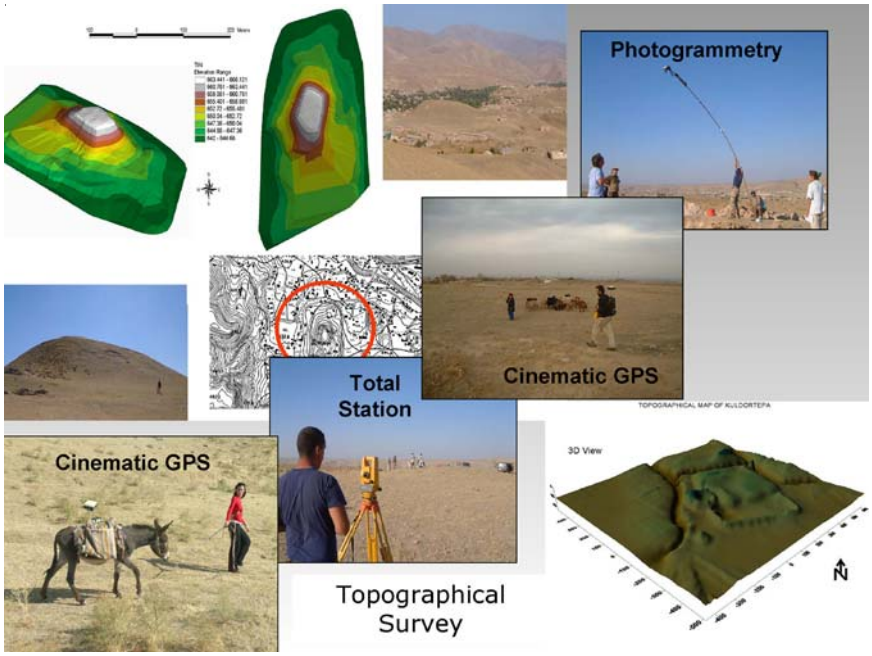

Fig. 4. Topographical site reliefs created using Total Station GPS. Recovery and digitization of former maps for a methodological comparison with the present situation.

important insights about ancient hydrography and the relationship between sites and topography.

We chiefly worked with two types of satellite imagery: multi-spectral Landsat TM7 and ASTER images, and Corona images. Landsat TM7 imagery (20-25 meter resolution) and the even better ASTER imagery (15 meter resolution) are especially useful in order to trace road systems, canals, ancient river beds, paleoconoids, main water flows, meanders and similar geographic information on a regional scale. It is then possible to obtain an overall view of extended areas as well as important information about the water systems that existed prior to the 20th century irrigation canals [Mantellini 2003]. It has also been possible to create vector data of the geology and current soil exploitation by working with automatic classification algorithms on ASTER and Landsat images.

Corona panchromatic images were taken by United States Defense Department spy satellites between 1960 and 1974, and have been made commercially available by the United States Geological Survey (USGS) since 1995. The use of these images, which pre-date many of the major agricultural reclamation projects, proved itself equally precious for their high spatial resolution (8, 5, 3 meters) and for their historic value. By digitizing these images and using specific software for their analysis, it has been possible to identify sites which are today destroyed and thus obtain important topographical and spatial information. In these areas, surveys were then conducted in order to verify the presence of sites or of concentrations of archaeological material [Mantellini and Rondelli 2003].

All the data gathered has been brought together in a GIS archive, which makes analytical elaboration and modeling possible. The capacity of GIS for overlaying geographical and environmental maps with those representing the archaeological record provides a baseline for making synchronic and diachronic distributive analysis. This also enables us to integrate the former studies about the area, by incorporating the information available in the literature into relational databases [Isamidinov 2002], and by Optical Character Recognition (OCR) text scanning [Shirinov and Tosi 2003].

The GIS thus developed can then be applied to the analytical phase of our work. Indeed, GIS is an excellent instrument for the development of geographical, mathematical, and quantitative systems and models (from trade, traffic and management functions to dynamic-hydrodynamic systems application in the reconstruction of territorial evolution), while the treatment of statistical data, processed according to relations and combinations, makes it possible to formulate predictive models of settlement.

To better understand these settlement modalities it is particularly important to render and simulate the ancient landscape. This can be achieved by applying specific software and through mathematical interpolations based on *net* and *fractal fragmentation* theories [Buchanan 2002; Gardenfors 2004]. This particular approach will allow the creation of a Geographic Modeling System (GMS) where spatial information will be connected to the temporal variable in order to create thematic representations of the evolution of the landscape and the hydrographic network through time (Fig. 5, next page). Present-day DEM, thematic GIS, and archaeological paleoecologic data are used to create a scientific simulation, based on a process of spatial-chronological subtraction using specific ecological-environmental simulation software. This leads to

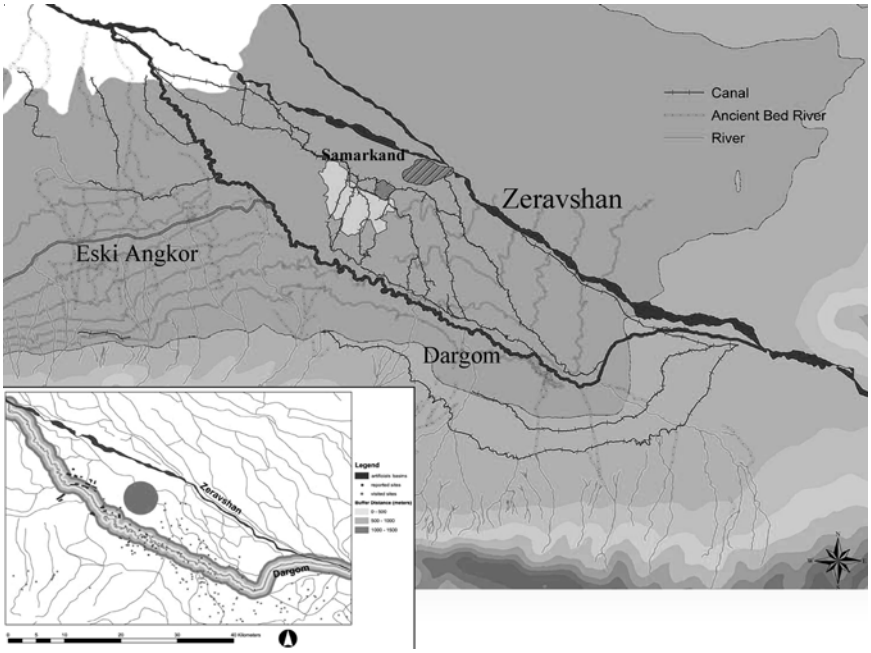

Fig. 5. The history of human settlement appears substantially connected to the "history of rivers" as an element, readable on the landscape, of what for populations is the "network effect" of a careful planning of resources and exploitation.

the creation of knowledge models that can explain data, and allow them to be verified and replicated in the next interpretative phase [Cattani et al. in press; Costanza and Voinov 2004].

The development of this project, and the necessity of incorporating the diverse data already existing, made the cooperation between our team and local institutions indispensable (in particular the State University Geographical Institute in Samarkand and the National Geological Institute in Tashkent). We are now planning the creation, in the Samarkand Region, of a Territorial Information Systems (TIS) office in order to insure the continuous and updated management of all data related to Samarkand and its territory, of which a central basis will be the creation of a Master City Plan and the Archaeological GIS archive.

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Reasoning with GIS : Tracing the Silk Road and the Defensive Systems of the Murghab Delta (Turkmenistan)

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Bologna University

Over the past fifteen years, a major joint Italian-Russian-Turkmen project has enabled the creation of an archaeological GIS of the Murghab delta. This project has involved some fifty different specialists, resulting in numerous studies and a preliminary project publication [Gubaev et al. 1998]. The GIS is still under construction. However, it already includes over 1000 sites with associated archaeological data and a great deal of cartographic and other geographical information. The project evolved at a time when GIS was only just starting to be applied to archaeology, and all information was classified in codified categories developed *ad hoc* for this purpose.

The Murghab delta is a terminal alluvial cone situated in the Karakum desert of Turkmenistan (Fig. 1). The only supply of water before the construction of the massive Karakum Canal during the Soviet period came from the Murghab River itself, a single trunk-course deeply encased near its source in the hilly piedmont of the northern Paropamisus (Afghanistan), which spreads into a wide alluvial fan of rich farmlands in the terminal delta. This became one of the largest irrigated areas in Central Asia as early as the Bronze Age. After Alexander's conquest in 332 BCE, Margiana, and in particular the ancient capital of Merv, developed as a nodal point along one of the most active Silk Road sections, opening direct trade relations with China [Cattani et al., p. 125; Bader et al. 1993-94, p. 51].

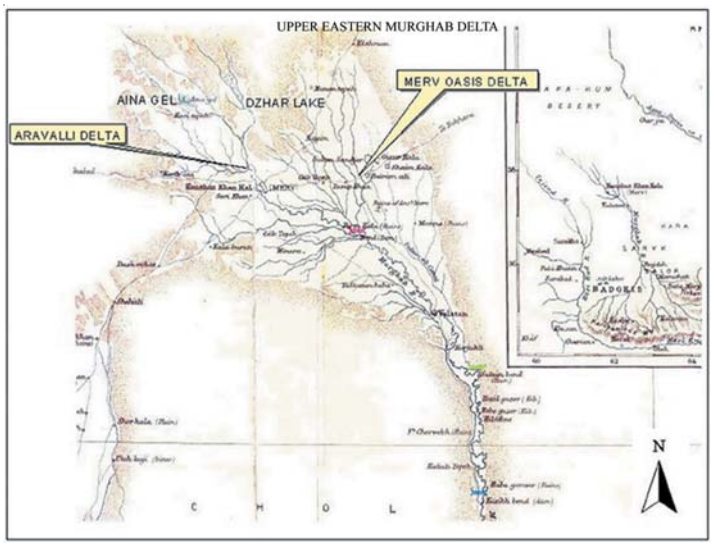

Fig. 1. The Upper Eastern Murghab Delta.

While developing the archaeological map of the Murghab delta from field surveys and archival data of the Soviet period, we have assembled a vast collection of maps and rare data concerning the climate, soil, vegetation and economy of the region, including statistical spreadsheets from government agencies from the late 19th century to World War II [Cerasetti 2000-2001]. One of the main aims of our research concerns the definition of the chronological sequence and reconstruction of the main irrigation systems, elaborating the data on the river's morphological evolution by means of GIS applications. Surface and historical mapping [Abbott 1843; Stewart 1881;

Lumsden 1885] and intensive walking transects with aerial photos from low altitudes and space platforms (CORONA 1964, Landsat-7 2001, NASA Landsat Mosaic 1999, IKONOS 001 [Ziebart et al. 2002]), as well as reconnaissance flights for oblique observation along sub-fossil meanders, allowed us better to understand the main changes characterizing the life of the Murghab river [Cerasetti 2002; Cerasetti and Mauri 2002].

One of the first targets is a fine-grained reconstruction of the delta configuration before the large scale development projects carried out under Russian rule (Fig. 2). The combined support of digital archive data from GIS and the analysis of satellite imagery of the alluvial fan allow us to understand the complex processes based on settlement fluctuation, and to reconstruct the palaeochannel network of the Murghab delta (Fig. 3).

Fig. 2. Ancient dam of the Sultan Band.

Another aspect under investigation is the evolution of patterns of fortification.The employment of remote sensing data allowed us to study the defensive fronter systems in Margiana from the Iron Age 2 (Yaz II/900-550 BCE) until the Parthian period (190 BCE-550 CE). Before the consolidation of Achaemenid central power, two impressive south-north fortress lines were erected along the northeastern side of the Murghab delta [Genito 1998, p. 125, Fig. 1], probably defending the cultivated area and the main waterworks (Fig. 4). The lack of water must have been a problem for the subsistence of an increasing population and the water source control of the Murghab River presumably corresponded to a “territorial control” of the Margiana region. Today much of the Murghab delta is covered by vegetation, making it impossible to collect data by survey. However, the observations made on CORONA satellite imagery have made it possible to localize the southernmost complex of the eastern frontier, known as Garry Kishman [Cerasetti and Mauri 2002, p. 2], founded during the Iron Age 3 (550-340 BCE) period (Fig. 5, next page).

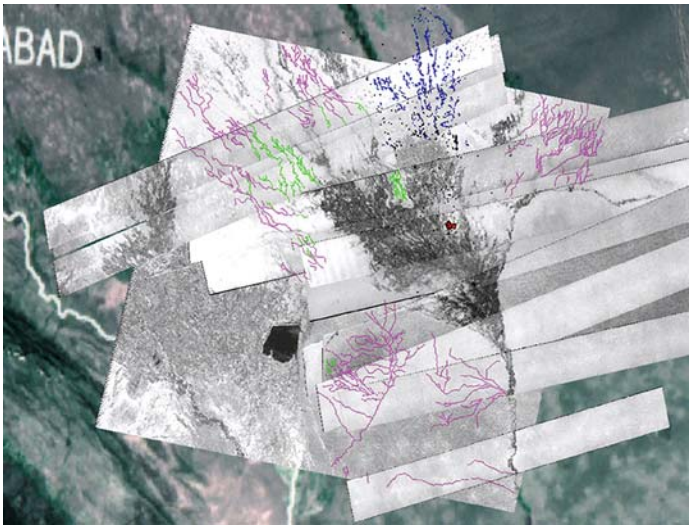

Fig. 3. Reconstruction of the palaeochannel network of the Murghab delta.

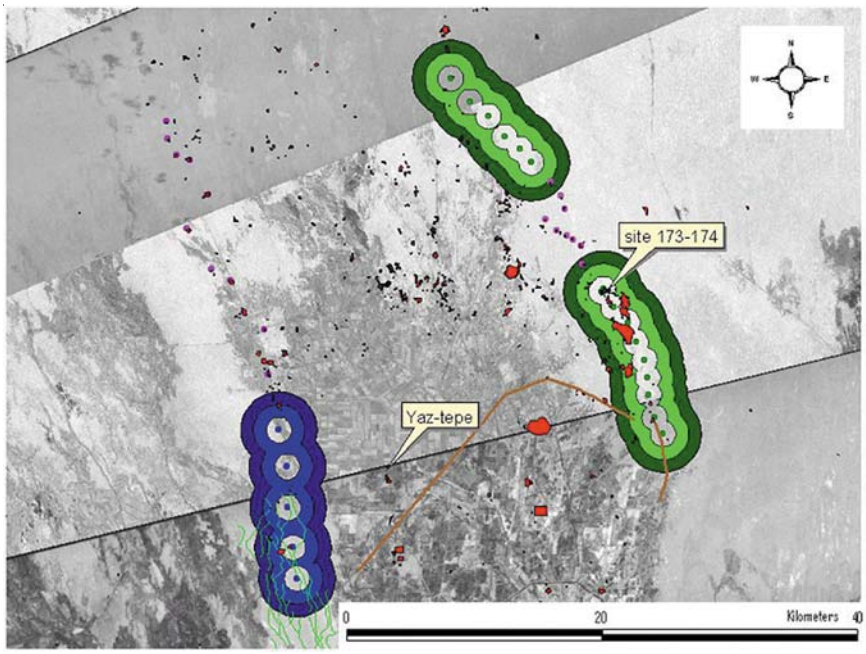

Fig. 4. Fortress lines along the northeastern side of the Murghab delta.

With the beginnings of large scale trade along the Silk Road, we can detect the appearance of another form of fortification. By using multispectral ETM Landsat images from NASA Landsat Mosaic (1999) (Fig. 6) we have been able to locate a line of fortresses along a new Silk Road section to the

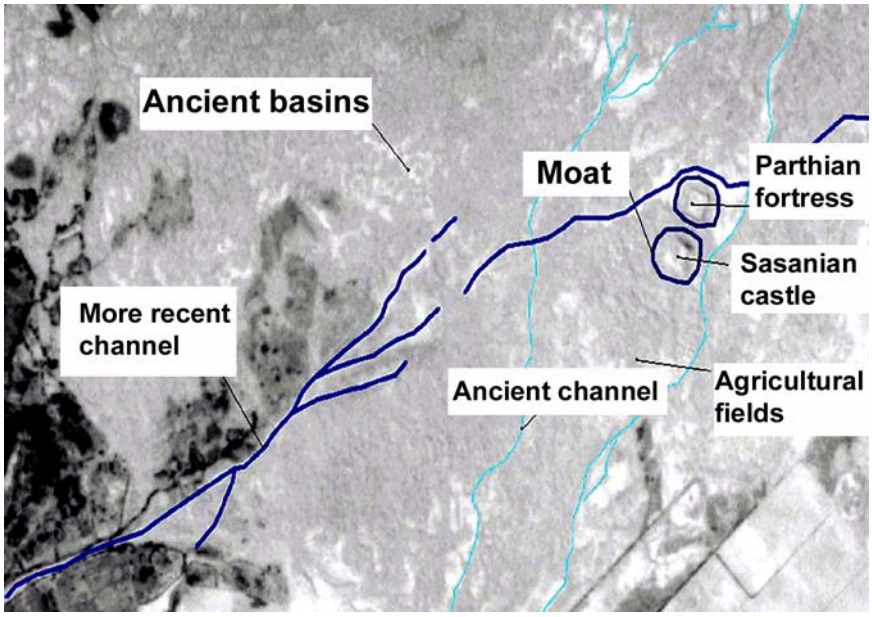

Fig. 5. CORONA detail of Garry Kishman.

north of the Samarkand-Hecatompylos trade route, crossing Merv in the Murghab delta. We singled out seven rectangular plan fortresses, measuring approximately 10 ha. each, and situated at a distance of about 50 km (Fig. 7, next page) along the Kelif Uzboi riverbed, the southernmost dry canal of Uzboj [so-called in Russian scholarship: Bader and Usupov 1995, p. 29, Fig. 1]. The fortresses are well defended by impressive walls, and their regular plan and their size suggest a date in the Parthian period. Many exotic high-quality objects have been found dating to this period, a fact linked to the increase of trade exchanges between China and the Parthian kingdom of the Arsacids, in particular under Mithradates II (123-87 BCE) [Boulnois 2001, p. 59; Frye 1984: 360; Bader and Usupov 1995, p. 27; Callieri in press, p. 541].

The fortresses probably defended caravans and exotic goods coming from Bukhara or Khiva and also constituted a rest point for travelers and animals. Pack animals were mainly camels, the most adapted species to hot and dry climates and, in particular, to long distance travel across the Central Asian deserts [Wapnish 1981, pp. 104, 108, 121]. Numerous and different criteria characterized caravan travel of the time: camel number, loaded weight, strong temperature range etc. "...the average rate was fifteen to sixteen miles [per eight-hour day] for a heavily laden caravan, seventeen to eighteen for a moderately laden, and twenty to twenty-two a day of ten hours for a lightly laden caravan" [Zoghby, p. 1]. This means that a distance of 50 kms. (= 31 miles) from one station to the next corresponds to approximately a two-day journey, and maybe a one-day journey for a lightly laden caravan [Boulnois 2001, p. 209-210]. From Hecatompylos to Bukhara at the North of Merv, a lightly laden caravan would therefore employ three weeks to cover 1046 km. (= 649 miles), crossing the Amu-darya river in the proximity of the modern centre of Chorjuyu. We hope to confirm the present working hypothesis by the acquisition of higher resolution imagery.

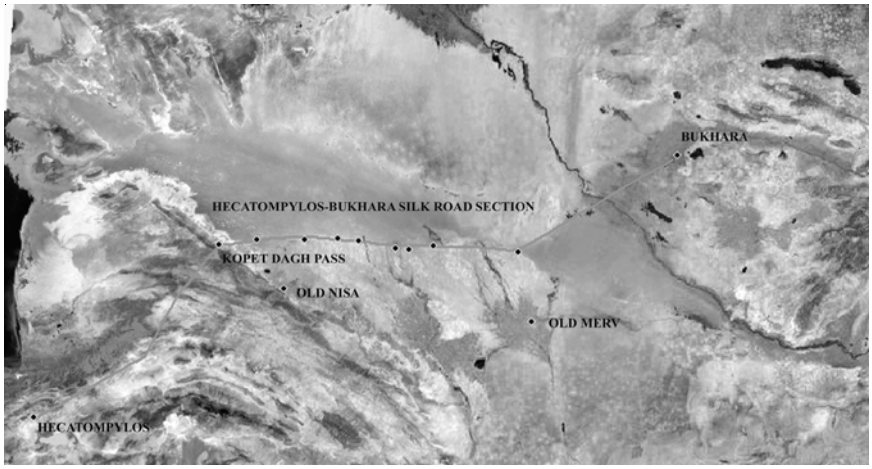

Fig. 6. NASA Landsat Mosaic with Hecatompylos-Bukhara section of Silk Road

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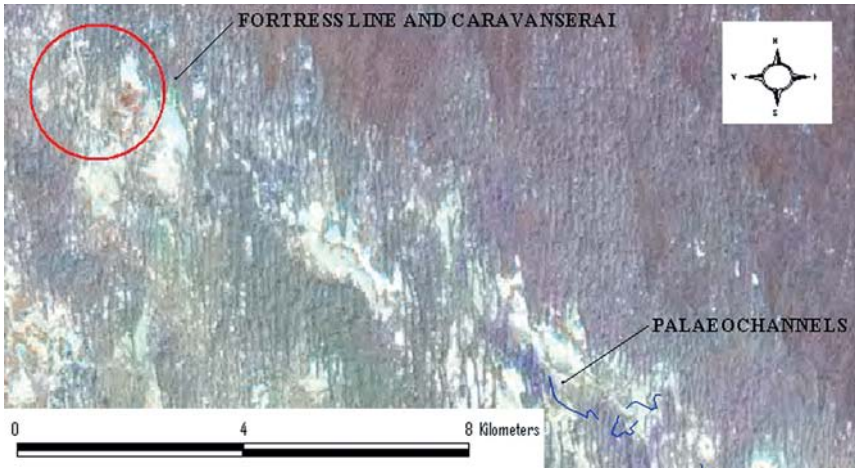

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Evolving the Archaeological Mapping of Afghanistan

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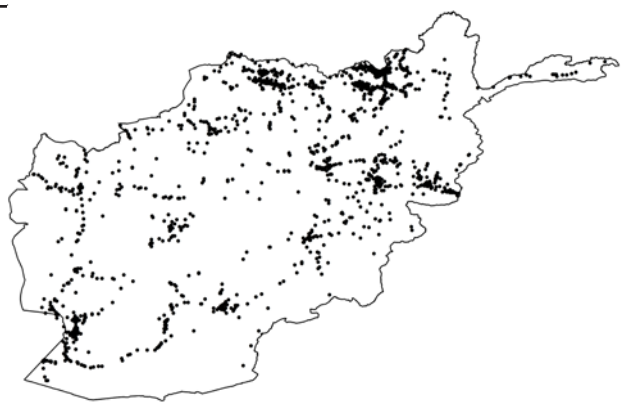

Fig. 1. Sites mapped in the GIS.

The application of GIS to the archaeological mapping of Afghanistan offers an excellent means of evolving a new platform for synthesizing and interpreting data, for assessing and monitoring the preservation of sites, and for the eventual collection of new data. In conjunction with other Central Asian GIS projects, it can also form a tool with which to study historical human geography within and across the region, and themes such as the evolution of settlement patterns and cultural interactions across the Iranian plateau and Central Asia. The GIS described in this section is a first step in this direction, containing over 2000 sites and associated data sets, derived from the *Archaeological Gazetteer of Afghanistan* [Ball 1982], the French surveys in eastern Bactria [Gardin 1998; Lyonnet 1997; Gentelle 1989] and other sources.

From maps and catalogs to GIS

The two main sources of archaeological data digitized were the *Gazetteer* and data from the plains east of the Kunduz river, which were the object of an extensive regional survey by a French team in the 1970s. Geographic and cartographic "base map" data sources include publicly available vector data such as National Imagery and Mapping Agency (NIMA) Vmap1 and current data from Afghanistan Information Management System (AIMS), as well as raster data such as 3-arcsecond Digital Elevation Models (DEMs). Of great potential are geo-referenced 1:100,000 and 1:50,000 Soviet military topographic map sets, which not only allow for precise localization of known sites, but the addition of hundreds of undocumented sites, which are marked as mounds on these maps (Fig. 1).

The *Gazetteer* data were digitized by scanning the site catalog, performing text recognition, and creating a single database record for the text of each catalog entry, including its detailed description, periodization, bibliographic references, etc. The coordinates given for each site were extracted automatically into separate database fields and converted into decimal degree format. Because seconds are not provided in these coordinates, the resulting calculated decimal degree coordinates significantly exaggerate their geographical precision (since the geographical range of sites within one minute could amount to a difference on the ground of over a kilometer). Entries in the *Gazetteer* spanning more than one geographical minute were averaged into one decimal degree coordinate. Averaged coordinates are mainly the groups of sites subsumed by Gardin into one catalog entry in the *Gazetteer*, but most of these were individually localized much more precisely in the digitization of more data from the original survey maps of the Gardin team. Such precise localizations are necessary in areas crowded with sites, which sometimes even bear the same names.

The separate publications of the latter data formed the second main source for the GIS. In three seasons (1974-5-6) of survey in the Dasht-i-Qala plain, approximately 200 square kilometers were surveyed, recording 349 sites, while one season (1977-8) of extensive survey across some 1,500 km. recorded 474 sites. The GIS in its present form contains localizations only of the sites of the extensive survey (mapped in Fig. 2); however the digitized site database includes records for the remaining 226 sites in the Dasht-i-Qala plain.

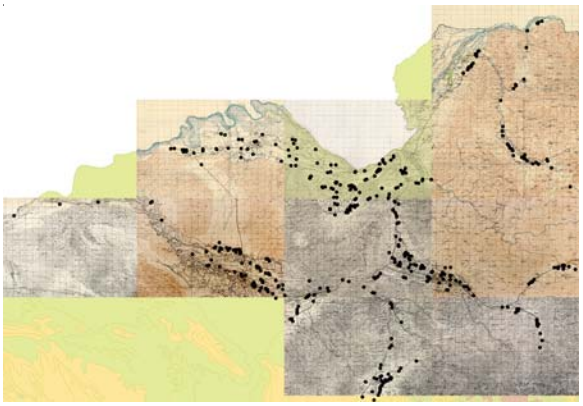

Fig. 2. Sites of eastern Bactria (excl. Dasht-i-Qala plain).

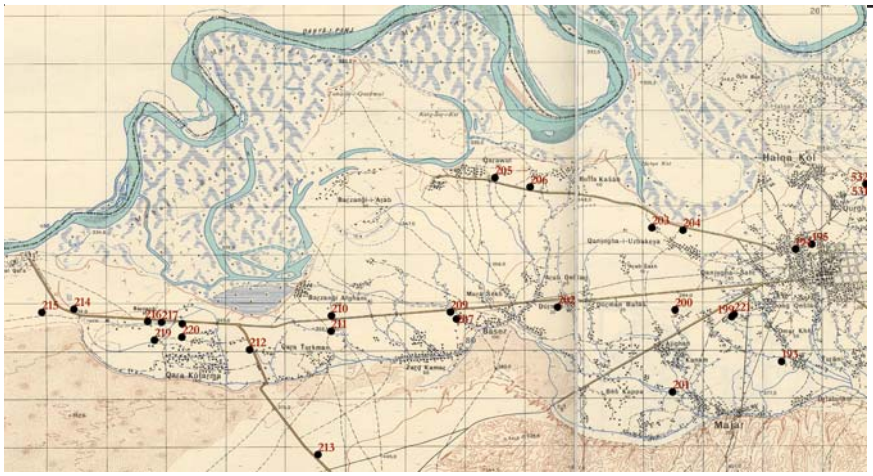

Fig. 3. Sites in the area of Imam Sahib, near the Amu-darya.

Data have so far been entered in the database for these fields: number (sometimes with sub-number identifying letter); Ball number and sub-number identifying letter (A, B, C, etc.); a 'D number' for sites in the Dasht-i-Qala plain (to distinguish these sites, which are numbered in a different sequence); name when given; the designated geographic area, sectors, subsectors, and sub-subsectors, and finally the presence-absence fields for the different ceramic groups at each site. The complex set of fields used for coding the ceramic finds at each site is a function of the notation of periodization used by Gardin [1998], which generally refers to degrees of certainty of attribution (and which is not always the same as the identifications in Lyonnet 1997).[1] Exclusive of a subset of sites in the Dasht-i-Qala plain, the present form of this subset of the digitized site database thus contains 695 complete records.

Not yet included in the database is the full narrative description for these sites, which generally contains a measurement and descriptive localization (itinerary). No coordinate locations are given in this site catalog, but in the localization in the GIS through the use of the original maps used on survey, coordinates were identified within a estimated precision of hundreds of meters for most sites (and the descriptive data could be used for even greater accuracy in localizing sites with larger scale maps). These original survey maps were a set of 1:100,000 scale Soviet topographic maps and corresponding photocopies marked with the field data from the survey.[2] Some of the maps were themselves large-format black and white photocopies or color reproductions of varying quality. The photocopies of sections of these maps corresponding to sectors or portions of sectors described in the survey synthesis were marked with all the sites recorded on the survey, labeled with the survey number. In the case of larger sites a sketch of the extent and shape of sites was where one 'x' or a small circle identifies a series of sites, a point was entered at the center of the shape (Fig. 3).

Even in rare cases where exact locations of individual sites were not indicated, the error can be estimated to be under a kilometer, and in most cases the accuracy of the coordinates digitized in this fashion are probably better or even similar to the total error range of a standard (non-survey) GPS receiver. The maps published in the survey synthesis were consulted during the digitization process, but because of their schematic nature, the sources described above were given preference in making all geographic determinations.

Desiderata for database development

Data from sources not entirely included in the *Gazetteer*, such the Soviet-Afghan mission [cf. map in Sarianidi 1976], as well as unpublished ones, also need to be incorporated. The development of the database also requires reorganization of the material which has already been digitized. Database entries from the *Gazetteer* contain entire texts of catalog entries in one field, with the exception of coordinates. While this text field can be queried (e.g. for the string "Bronze Age" or "Kushan"), including spatial queries, the ability to carry out more complex queries on the *Gazetteer* data is limited, and each of these entires should be converted into database fields, for which they are essentially already structured.

Separate database fields are important for bringing the data on a uniform level with other site databases, as well as for analysis. This is particularly relevant for periodization and site size, but other fields contain data of significance for interpretation — for example the fieldwork type (excavation, survey) could be compared with new data on intensity of survey (scale of intensity, quantified in terms of time, surface area collection size, etc.). The incorporation of a structured, site-by-site bibliographic database is likewise an important aim. Finally, the inclusion of the site plans, and the creation of a photographic database, are goals for developing the database as a tool to track the state of preservation of sites and

collections. A unified database form should ideally encompass a spectrum of formats from fields which contain discrete quantifiable data which needs to be formalized for analytical purposes (spatial queries, etc.), to more descriptive fields which can contain miscellaneous descriptive information, notes etc.

Finally, without ground-truthing, inaccurate or imprecise localizations can only be somewhat ameliorated by consulting original archaeological publications and comparing cartographic sources. The correction of geographic localizations can also sometimes be achieved using higher quality cartographic sources, and the Soviet topographic sets also record many mounds which have not been examined or identified, but which are in many cases archaeological sites. An important task would be creating a point feature set from all mounds marked on these maps, identifying those which are documented in the literature, and taking the remaining mounds as a basis for future documentation (point sets can simply be downloaded into a GPS and then navigated to as waypoints).

Potential applications

Over twenty years ago, after collecting and reviewing most of the existing archaeological data from Afghanistan, Ball offered an assessment of the work to be done in the Introduction to the *Gazetteer* [1982, p. 20]: "Generally ... the need for survey – and survey of a systematic and organized sort – appears to be paramount. In many ways, surveys can answer more questions than excavation." While a GIS database including unpublished material and material published since the *Gazetteer* offers new possibilities for the interpretation of existing archaeological data, and for remedying some of the many imbalances in our knowledge of Afghanistan's past, the need for survey can only have grown during the tragic events since the time of Ball's judgment.

Many factors may of course limit the logistical feasibility of carrying out any kind of fieldwork in Afghanistan for years to come. Nevertheless, the return of stability in certain regions of the country has made it possible for archaeologists to renew fieldwork and even undertake some limited excavations [Tarzi 2004; Franke-Vogt n.d.], and several important discoveries have already been made [Lee and Sims-Williams 2003; Grenet, Lee, and Ory, n.d.]. This work, undertaken by scientists hazarding the dangers of travel in the countryside of Afghanistan, follows a series of spectacular discoveries over the past decade which were sadly made in undocumented and illicit circumstances, such as a group of Bactrian socio-economic documents, which have unveiled what was essentially an unknown language [Sims-Williams 2001]; new inscriptions, which have settled questions of chronology that kept generations of scholars busy with speculation [Falk 2001]; large numbers of Kharoshthi birch-bark scrolls, which proved to be the earliest Buddhist manuscripts known [Salomon 1999]; the Mir Zakah hoard, "one of the largest coin deposits attested in the history of mankind" consisting of "three to four tons of gold, silver and bronze coins" [Bopearachchi 1999, p. 109], as well as a host of other material which has surfaced on the antiquities market, such as Bronze age funerary material from Bactria.

The appearance of such a wealth of material in a such a chaotic fashion only underscores the need to design a GIS database to accomodate new data, and when and where possible, from new surveys, which offer perhaps the best possibility for effectively documenting a large amount of data before it is lost. Some possibilities in this direction include designing the database to accommodate data from different survey techniques; adapting a ceramic database template for surface collection; establishing a baseline for evaluating (or indeed, if possible, quantifying) the current preservation of sites, against which historical and future assessments can be measured; establishing a protocol for collecting photographic documentation (for example, following relatively simple methods which will make it possible for the images to be post-processed for photogrammetry); creating a general database template which can be distributed to archaeologists and others working in the field, and so on. Obviously, a GIS of Afghan archaeology should be designed with such potential applications in mind, and should be open to international collaboration of the broadest scope.

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Notes

1. In collaboration with several scholars, a database derived from Lyonnet 1997 is in the process of digitization, which is an especially important component, because it provides a detailed ceramic typology with comparisons across the region.

2. The original maps and photocopies were generously provided by Jean-Claude Gardin to the author and Sebastian Stride, who has collaborated on many aspects of this project.

Fig. 1. A modern excavation such as this generates vast quantities of irreplaceable data. This excavation at Domuztepe (Turkey) generated over 10,000 images of archaeological contexts, artifacts, and other finds.

Storing and Sharing Central Asian GIS: The Alexandria Archive

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While GIS and related technologies are revolutionizing archaeology and related disciplines, they present their own challenges. Vast amounts of data are generated in digitizing regional data-sets, and in contemporary techniques of data collection in "digital" archaeology. Projects that use GIS, such as those described in this section, are a case in point. A single archaeological excavation or survey can produce literally thousands of digital photos, maps, plans, drawings, analyses, databases and reports. Archaeologists produce all this information because such detailed recording and observation is fundamental to understanding the past. Excavation is also an inherently destructive enterprise. In some ways, to dig a site is to destroy it. Therefore it is absolutely vital that archaeologists record, preserve, and share the results of their work. Without thorough publication and wide dissemination of research, we run the risk of losing the past and our historical memory.

However, the sheer volume of information generated by digital archaeology makes thorough and complete publication almost impossible with traditional means (Fig. 1, preceding page; Fig. 2). More and more, archaeologists are looking toward the Internet to share the results of their research.

The Internet poses special opportunities and challenges for the dissemination of scholarship. Most researchers now depend on e-mail for casual correspondence and coordination of projects between colleagues. However, while e-mail has seen general acceptance in the scholarly community (despite the twin curses of junk mail and the daily deluge of messages that require instant replies), the Internet has yet to become an important avenue for the dissemination of research.

Given the obvious power of the Internet, why the resistance? One of its greatest advantages is that it is ubiquitous and relatively cheap in the contemporary world. In contrast, paper journals, books and other publications are all very costly, both to acquire and to store. However, the Internet is a dynamic, decentralized, and largely unregulated free-for-all of ever changing news, rumor, wild speculation, commercialism, and the bizarre. While this has certain advantages for some applications, it poses difficulties for scholarship. How do you find sources that you can trust, cite, and rely upon?

The vast majoity of current web-content lacks the rigor and longevity needed to support scholarship and instruction. Though many researchers make limited use of the Web for "public relations" efforts and limited instructional purposes, few rely on the Internet as a means of authoritative publication. In general, scholars are resistant to using the Internet as a vehicle for formal publication, because they are not yet rewarded for doing so. Researchers advance their professional careers primarily through successful publication in peer-review journals (the more prestigious and rigorous the better). There are now very few outlets for online, peer-review publication on the Internet, so there is little incentive for researchers to produce online content.

The Alexandria Archive Institute (http://www.alexandriaarchive.org) is meeting this challenge by working with professional societies to develop scholarly online dissemination channels. We are currently developing "AnthroCommons" for the American Anthropological Association (AAA). AnthroCommons will enable researchers to share and comment upon conference papers presented at the annual meetings

Fig. 2. A GIS plan and digital imagery of a massive bone deposit from Domuztepe, a Neolithic site in Turkey.

of the AAA. The same review process that selects abstracts and moderates sessions for the AAA meeting will work in AnthroCommons. We will provide multiple copyright license choices for AnthroCommons participants, including the option of using "open" Creative Commons licenses [see Brown 2003; Kelty 2004]. These licenses remove copyright restrictions and permit anyone to copy and share a work, so long as the author is properly attributed. Thus, Creative Commons licenses represent an essential aspect to digital dissemination; they help insure scholars are recognized for their contributions while freeing content for widespread distribution, use, and incorporation into new scholarly works.

In addition, online content still faces tough questions regarding permanence. Information on the Internet is highly volatile. Scholars require some guarantee that the sources they cite today will be available to be referenced and reevaluated tomorrow. Most now turn to a very limited application of the Internet for scholarship by using online offprints of printed journals. The Andrew Mellon Foundation's JSTOR project has been a leading force in using the Internet to deliver offprints of articles published in leading journals across several disciplines. Many popular archaeological journals, including the *Journal of Archaeological Science*, *Current Anthropology*, and the *Journal of Anthropological Archaeology* are disseminated online via JSTOR. Not only do users of JSTOR gain instant access to the scholarship contained in these peer-reviewed publications, they are also assured that the information they use and cite is backed by the permanence of print.

Despite the impressive success of JSTOR and similar services, they cannot, in themselves, meet the needs of contemporary archaeology. JSTOR uses the Internet essentially to deliver facsimiles of printed journals. These facsimiles suffer from the same constraints as paper. Since large data sets are too unwieldy to be published on paper, they are also too unwieldy to be useful as mere electronic facsimiles.

Other strategies are needed to complement JSTOR and printed journals. JSTOR and printed journals deliver mainly summaries and interpretations of larger data sets. Without preservation and dissemination of all the data, our knowledge of the past is limited to such summaries and idiosyncratic interpretations. Science (and scholarship in general) requires theories and interpretations to be constantly re-evaluated and reformulated in order to advance. By not publishing the full picture of our archaeological excavations and surveys, we limit the freedom future generations will have to reach their own understanding of history.

The Alexandria Archive Institute (AAI) was formed in 2001 to meet this pressing need to preserve and fully disseminate archaeological information. Among the AAI's first projects, is an online information resource for Central Asian Archaeology. The results of this project on Bactrian archaeology will be delivered to students and scholars everywhere by the Alexandria Archive Institute.

In order to meet this mission, the AAI is adopting a sophisticated information management system developed by Prof. David Schloen at the University of Chicago. His "Archaeological Markup Language" has several key advantages that will give archaeologists enhanced abilities to share and preserve their data. What is the "Archaeological Markup Language?" It is an implementation of XML (extensible markup language) developed for archaeology. While most Web pages are written in the more familiar HTML standard, XML is a vastly more powerful development now used in business to business communication and numerous scientific applications. XML enables us to bring the analytic power of databases to the open communication and connectivity of the Internet.

A key advantage of using an XML scheme like the "Archaeological Markup Language" is that we are not dependent on proprietary standards. This has tremendous data preservation advantages because proprietary data formats often change and can quickly lapse into a "cyber-death" of unreadability. Moreover, any scholar or institution can implement the Archaeological Markup Language. This opens the door for building tremendously powerful "distributed archives" that chronicle the entirety of world history! For archaeologists who try to develop meaningful understandings of huge amounts of complex data, these capabilities are very exciting. By implementing the XML "Archaeological Markup Language," we will go beyond a simple repository of information, and create new research tools and resources to share, explore, integrate and synthesize information about the past.

Because archaeologists have such great difficulty using (and even finding) primary data, they face enormous challenges in synthesizing an understanding of even one site, much less an entire region. Thus, our understanding of social and cultural change on the regional or interregional level is limited to impressionistic summaries of already second-hand summaries and interpretations. As research accumulates it is becoming ever more difficult adequately to command the primary literature. Given the glut of information and

the lack of good tools for regional comparison and synthesis, researchers are becoming ever more specialized and afraid of tackling the "big questions" of the past.

By using the Archaeological Markup Language, we will enable unprecedented capabilities fully to use and reexamine primary data. The Archaeological Markup Language has a powerful flexible data model that can provide a common structure to diverse sets of archaeological and philological data sets. This flexibility is essential to insuring that online data repositories do more than just preserve information. With this tool, scholars can fully integrate different archaeological data sets and develop analytically rigorous and comprehensive new syntheses. It enables scholars to put together small pieces of knowledge to reveal the full picture of the past. When these technology solutions are combined with innovative intellectual property frameworks, as developed by Creative Commons, the result is an information infrastructure that enables research to be created, shared, used and reused globally. This collaboration between the AAI and Central Asian specialists is just one step in enabling this vision to become a reality.

About the Author

Eric Kansa received his Ph.D. from Harvard University in 2001. He has participated in archaeological excavations in Egypt, Israel, Jordan, and currently is working at the Neolithic site of Domuz-tepe in Turkey. He is the founder and Executive Director of the Alexandria Archive Institute and is a Visiting Scholar at Stanford University.

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The Search for the Origins of the Jew's Harp

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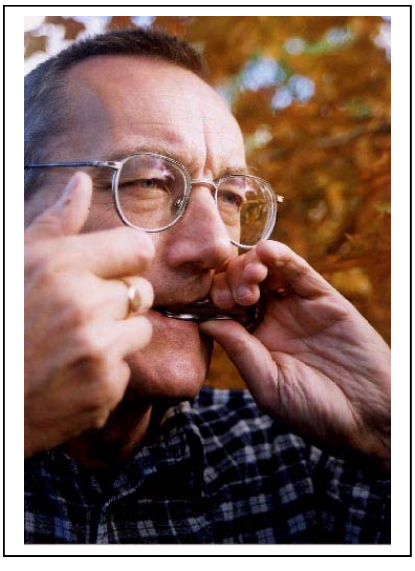


As a player of the musical instrument known as the Jew's or jaws harp, the two most frequent questions asked by my audience are, "How did it get its name?" and "Where does it come from?" One of the challenging and, at times, frustrating aspects of researching popular instruments is the lack of reference material we have to work with. Early writers simply did not think the instrument worthy of comment, or if they did it was often in derisory terms, not meriting serious study and, like many throw-away items, once the novelty had worn off or the instrument had been broken, it was discarded. Nevertheless, we have enough information to help us understand an instrument manufactured and played worldwide, constructed by craftsmen or mass produced in numerous forms and shapes reflecting the material available to the makers, and of ancient origin.

This article explains what a Jew's harp is and its global appeal; briefly explains what we know about the English language name; looks at the archaeological evidence; considers the relationship between instruments in Asia and Europe; and, finally, their likely transfer east to west.

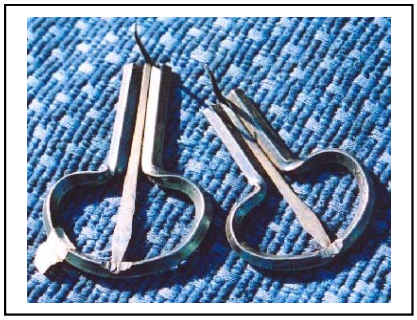
What is a Jew's harp?

The first thing to recognise is that Jew's harps are subtle musical instruments with an extraordinary variety of shapes, sizes and methods of playing.

They are international, being made extensively throughout the world from Polynesia, Asia and Eastern Russia to Europe and the United States. They are known in the Middle East and Africa, though these were exported from Europe or introduced as barter by early colonists and do not appear to be native to those countries.

A Jew's harp is a single reed instrument of two types: idioglot, where the vibrating reed or tongue of the instrument is cut from a single piece of wood,

bamboo, bone or thin flat metal, such as brass, and hetroglot, where there is a cast or bent metal frame to which is fixed a separate, flexible metal reed.[1]



To play the Jew's harp requires three component parts – the instrument, the player's mouth and a means of activation. The mouth acts as a sound-box and, though the Jew's harp itself has no musical quality other than the fundamental note that the reed produces as it passes between the frame, other notes can be produced by a player by altering the shape of his mouth, mainly by using his own tongue

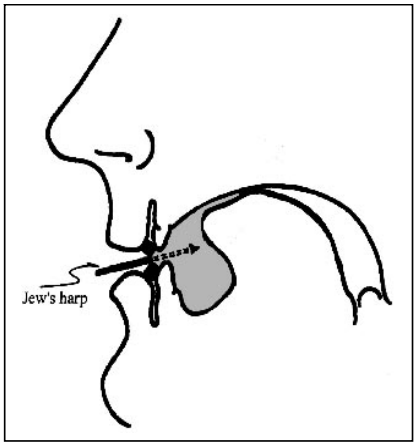


Fig. 1. Jew's harp & mouth cross-section – "high note" position.

to make the 'sound-box' larger or smaller. To produce a low note the player's tongue is placed at the bottom of the mouth, and to produce a high note the player's tongue is placed at the top (Fig. 1). It has been categorised as a plucked idiophone, or an instrument that creates sound primarily by way of the instrument itself vibrating, and an aerophone, or one that produces sound primarily by causing a body of air to vibrate — an argument that is still going on.

The name

Worldwide more around 1000 different names for the instrument have been noted, and the list is expanding. European languages mainly use *mouth* and sometimes *lips* or *teeth* linked with *trump* and *harp*. *Trump* in various forms and spellings are used today in Europe, such as *Mondtrom* in Dutch and *Tromp* in Flemish. *Harp* is used in Scandinavian countries, such as Norway, *Munnharpa*, Denmark, *Mundharpe* and Finland, *Huuliharpu*. *Doromb* can be found in Hungary, with *Drymba* in Ukraine and *Drombulja* in Serbia. As we go further east we have variations on *Komys*, *Kupus,* and *Khomus* in northern and eastern Asia, while *Morchang*, *Morsing*, *Dan Moi* and *Gengong*, can be found in India, Vietnam and Indonesia. As a general point, in Asia the instrument has a name relating to the material from which it is made, along with animal or insect terms and sounds, whereas in Europe it has more human connections and names of other musical instruments. There is, in addition, the use of more derogatory terms such as *lackey*, *bauble* and *snore* [Bakx 2004].

English is the only language where there is an association with a particular race. We have no idea why it became known as the *Jew's harp*, only that it remains the earliest name found to date. The instrument has nothing to do with the musical culture of the Jewish race, though the name confuses the issue of where it comes from as there is a natural, but erroneous, belief that the origins are Middle Eastern. The prefix *Jew's* is only used in English and small part of Germany and is first definitely identified as the instrument in a document dated 1481 as *Jue harpes* and *Jue trumpes*. The significance of this document, a petty customs account, cannot be underestimated, as it not only gives us the early name but a port of origin, Arnemuiden west of Antwerp, and the merchant for whom the consignment was intended, a certain William Codde. It also clearly indicates that the names *Jue harpes* and *Jue trumpes* were in common usage in the late 15th century and known to both customs officer and merchant [Wright 2004]. The term *Jaws* harp is not seen before the mid-eighteenth century. There has been a suggestion that the instrument might originally have been called a *trump,* from the French *Trompe,* but clear evidence is lacking. That name, however, is still used today in parts of Ireland and Scotland.

European and UK finds

Tracing the history of the instrument is largely reliant upon archaeological finds and the

Fig. 2. "Roman" Jew's harp.

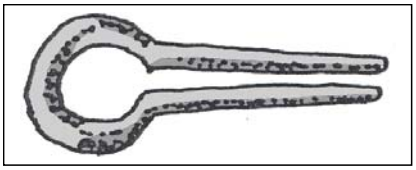


Fig. 3. "Anglo-Saxon" Jew's harp.

study of traditional types of instrument as used today or in recent times, researched by ethnomusicologists, and in museum collections such as the Musee de l'Homme in France, the Pitt Rivers Museum and Horniman Museum in the UK, along with studies by Soviet scholars and their successors. Collections have more numerous examples, but they lack the historical authenticity of actual finds when it comes to relating types to age. Archaeological idioglot finds are extremely rare, mainly due to the local climate and the material of the instruments, but when they do exist they are extremely old, ranging between 2,000 and 2,400 years. Hetroglot instrument finds are much more common, though almost exclusively they produce the frame only. Sometimes you come across fragments of the reed where it was fixed to the frame, but because the reed is the most fragile part, constantly in motion when played, plucked with the finger and allowed to run freely between the frame in order to obtain a note, it breaks quite frequently. Without its reed the Jew's harp is completely useless, although one frame was found used as a gate catch in Hawkshill, Surry, England [Elliston-Erwood 1943].

The age of finds is often hotly disputed and accurate dating has been difficult, particularly up to the immediate post-war era. Three Jew's harps, for example, discovered in the 19th century in Gallo-Roman sites at Rouen and Parthenay, in France, have caused some excitement in Jew's harp circles, as have a fair number of mid-20th-century instruments found in the Southeast of England and dated as Anglo-Saxon (Figs. 2 and 3). But we have problems. Firstly, while there is no doubt that the finds came from Gallo-Roman and Anglo-Saxon sites, they could have been dropped there at a later date and are sometimes described as top-soil finds. Secondly, when we look at how the instrument arrived in Europe, there is no evidence of indigenous populations of the Roman Empire using them and no references, to my knowledge, by Roman writers that such instruments were played. My concern regarding the Anglo-Saxon finds is that there is the similarity with Jew's harps recovered in an 18th- century North American site. We either have to accept that the frame shape remains identical from Anglo-Saxon to Colonial American times or that the Anglo-Saxon instruments are in fact

Fig. 4 Uppsala Jew's harp.

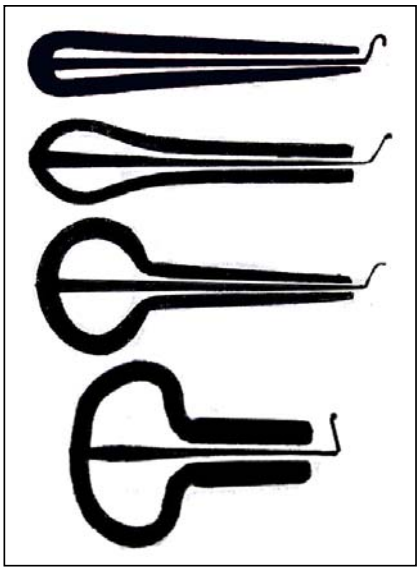


Fig. 5. Gjermund Kolltviet theory.

from the 18th century [Kolltviet 2000, p. 390].

One of the earliest accepted finds comes from Uppsala in Sweden, and is dated 13th century (Fig. 4). It is very distinctive, being hairpin shaped without the characteristic form of the bow shape now associated with modern instruments. Gjermund Kolltviet has recently completed a PhD thesis on 850 European finds, and his research is due for publication late in 2004. He has used a typology system to provide an explanation as to the relative ages of Jew's harps throughout Europe, with his basic theory being that the oldest instruments are like the Uppsala find and, as the instrument evolved, the bow section became more pronounced, while the playing section became shorter (Fig. 5) [Kolltviet 2000, p. 389].

We have visual references in Europe going back to the 14th century, the earliest of which comes from the seal of the

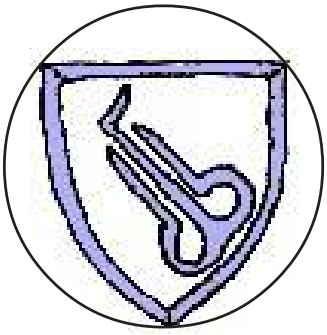


Fig 6. Seal of Trompii family.

Trompii family of Grüningen, near Aarburg, Switzerland, dated 1353, and there is no doubt that this is a Jew's harp of, if we accept Kolltviet's system, a late type (Fig. 6) [Crane 2003, p. 3]. In England there is a fantastic series of miniature enamels of angels playing various musical instruments displayed on the Crosier of William of Wickham, to be found in the chapel of New College, Oxford, one of which not

Fig. 7. Crozier angel.

only clearly shows a Jew's harp, but the angel flicking the instrument's tongue with his finger (Fig. 7). There are also a number of watermarks from the late 14th century from a widespread area of northern France and the Low Countries [Crane 2003, p. 4].

The only definite dates we can rely on for Europe are, therefore, the 13th-century find in Sweden, and the mid-to-late-14th-century images from the seal and the New College crosier.

Origins

Further to the east archaeological finds give tantalising glimpses of instruments from the 4th century BCE on (Fig. 8), but finds are few and far between and the time gaps are immense. A better idea of the huge variety of instruments is provided by the study of local instruments collected by museums. Bringing together these two strands provides a bigger, if risky, picture (Map 1).

Fig. 8. 3 BCE Chinese drawing.

The most likely and compelling theory of the beginnings of the instrument suggests an Asian origin, though there is no evidence to support the hypothesis. Bamboo examples are played throughout Asia and Polynesia but, because of the basic structure of the single reed concept, it is possible that the instruments evolved in various ways independently rather than from one single source. The Polynesian types, for instance, require the player to find an optimum part of the reed, which is then tapped or bounced upon a bony part of his wrist or knuckle allowing the reed to vibrate through the frame. Filipinos and North Vietnamese, on the other hand, have instruments that are plucked with the thumb or finger. A common method, however, that is found from Bali to Siberia, Japan to Nepal, is a string-pull (Fig. 9). It is this type that was found in Inner Mongolia dated circa 4 BCE (date unsubstantiated).

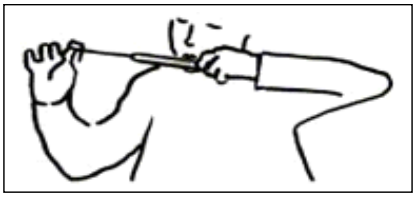


Fig. 9. String-pull bamboo Jew's harp.

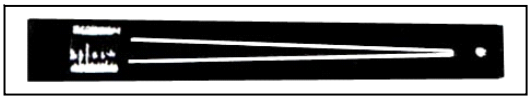
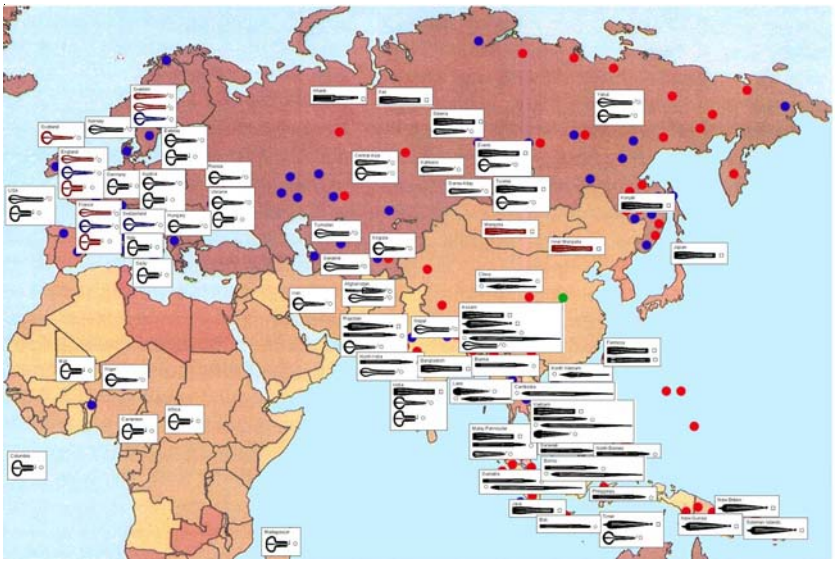


Fig. 10. Transitional Jew's harp.

Curt Sachs, the esteemed musicologist, suggested that the change from bamboo to metal is likely to have occurred in Northern India [Sachs 1921]. Sibyl Marcuse points out that the instruments of Taiwan and Engalio of the Philippine Islands represent a transitional type, as these are idioglot in form, but hetroglot in manufacture (Fig. 10) [Marcuse 1965, p. 264]. They are, however, on islands on the eastern periphery of known Jew's harp use. A bamboo or wooden frame with a metal tongue produced in Vietnam does have the characteristics of a hetroglot instrument, but might just as well be a copy of the metal type using local materials. What is apparent is that ideoglot

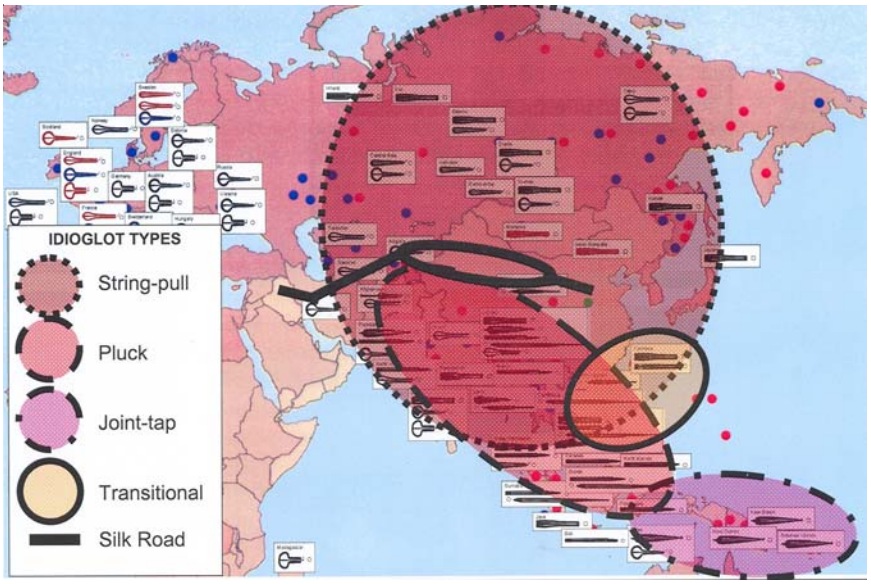


Map 1. World Jew's harp types.

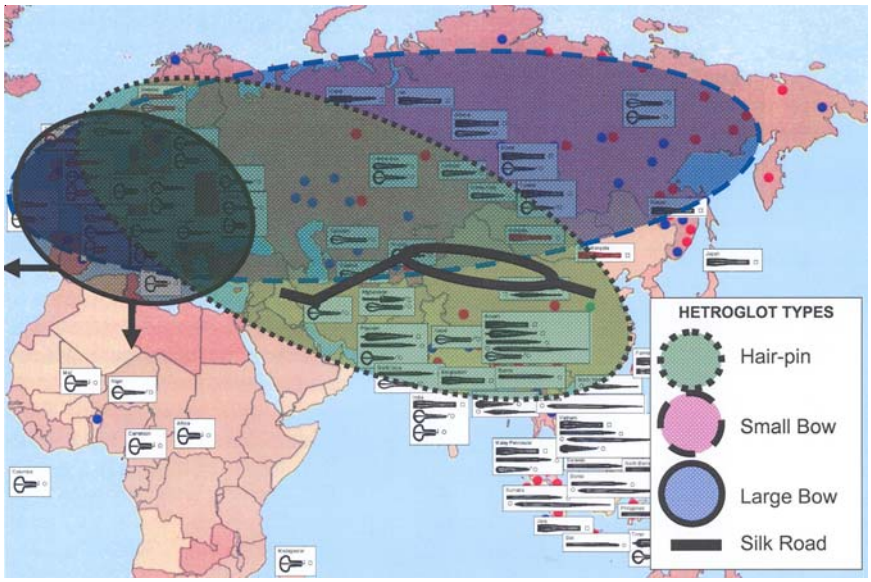
instruments centre around Asia and hetroglot centre around Europe (Maps 2 and 3).

The move from East to West

Theoretically the instrument could have been developed in Europe in its own right and not from bamboo single reed instruments at all. I think this is unlikely, all the evidence pointing to an instrument fully formed when in Europe. This means that at some point they moved from east to west, and the most likely source appear to be trade routes or migration. David Christian suggests that four cultural zones



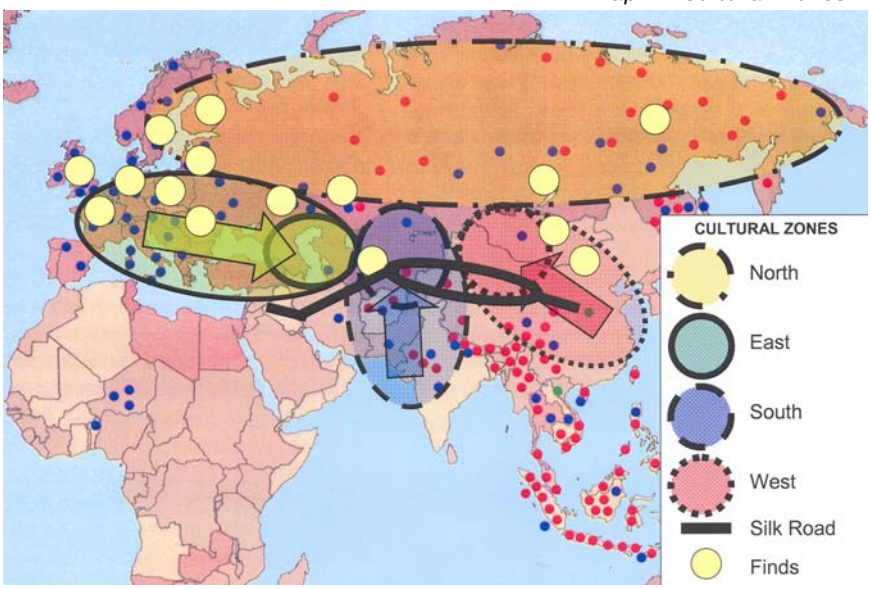
Map 2. Idioglot Jew's harp areas.



Map 3. Hetroglot Jew's harp areas.

> regions of Inner Eurasia. [Christian 1998, p. 18]

The western regions are indicated as the Urals and the Caspian Sea, influenced by the Mediterranean, Mesopotamia and Europe; the southern as Central Asia and Kazakstan, influenced by Iran, Afghanistan and India; eastern as Zungaria, Kansu (provinces in north-western China) and Mongolia, influenced by China, with a limited impact from the north that stretched from Scandinavia to the Bering Straits [Ibid.]. Linking



Map 4. Cultural Zones.

can be identified that have an influence on the region covered by the Silk Road. He notes that

> the important gateways into Inner Eurasia were through the northern and north western borders of China; across the Central Asian borders with Iran and Afghanistan, and through the passes of the Caucasus; and through the passage between the Black Sea and the Capathians that leads from the Balkans... channelling particular Outer Eurasian influences to particular

these to Jew's harps played in known regions provides a way in which they might have spread, particularly from the south and east (Map 4, previous page).

Going back to the Gallo-Roman finds in France, there was trade between Rome and India; so it is possible for the instrument to have arrived in Europe via that route. There are, however, no instruments played by the indigenous people on the western section of the Silk Road, which one might have expected and which we find in other areas to the north. Again the Anglo-Saxon finds might have come via the Hun invasions of the 4th century, particularly as more instruments are to be found in the area north of the Caspian Sea. Thus there is a more rational link east to west. Given the theory that the Huns originated from the eastern end of the Eurasian Steppe as the Xiiongnu (Hsiung-nu), and the wooden Jew's harp find from a Xiongnu burial site in Mongolia, this looks possible. The Turkic movements of the 6th and 7th centuries also look promising, and we have the trade routes post-Marco Polo and the Mongol invasions, both of significance in the potential for cultural spread, but possibly a little late.

Jew's harps in Asia, though scarce, have been found in archaeological sites in Bashkortostan, Altai, Khanty-Mansi Oblast, Buryatia, Sakha (Yakutsk, Vilyuisk), China (Inner Mongolia) and Mongolia (Map. 4). I have drawings of the Bashkortostan, and Inner Mongolia instruments, but not the others to date. So it is difficult to assess if there are any patterns of type or development, although with so few, it would be highly conjectural anyway. Finds from Finland make interesting comparisons with those played in Afghanistan, though how much emphasis can be put on the importance of modern instruments as indicative representations of a particular people's ancient traditions is also open to speculation.

Conclusion

The Jew's harp is an international instrument that is likely to have originated in Asia and travelled to Europe, arriving sometime around the 13th century. Archaeological evidence might push the date further back, and a substantiated Roman find would be a fantastic discovery, as would any instruments unearthed along the western section of the Silk Road. The Jew's harp appears in Europe fully formed. Older types could be hairpin in shape developing into the later bow section common today, but there are no idioglot finds. These could have been wooden and have rotted away, but the lack of any other description or indication of an evolving instrument seriously undermines an earlier existence before 1200.

That it is an ancient instrument, there is no doubt. Finds are gradually coming to light and the picture is a little clearer, but what may well move the theories forward is the pulling together of information from outside the specific archaeological finds and ethno-musicological collections. Trade looks to be a likely source. We await further revelations that I am convinced will appear. The important thing is that this musical instrument clearly is worth investigating further and that the evidence be collected, preferably in one place.

About the Author

Michael Wright (jews.harper@virgin.net) has been playing the Jew's harp since the late 1960's, and has studied the social impact and use of the instrument, particularly in the United Kingdom and Ireland, for the past six years. As a player he has performed at folk festivals in England and France and at the opening concert of the 2003 Galpin Society and American Musical Instrument Society — the first Jew's harpist to do so. As a researcher, Michael has published a number of articles for journals on subjects as varied as the discovery of the earliest English-language reference to the name, customs records from 1545 to 1765, the Jew's harp and the law and the various techniques of playing different versions of the instrument found worldwide. As a teacher he regularly leads workshops on playing the Jew's harp and gives talks on his research. Michael's main aim is to help raise the profile of this international, historic and versatile musical instrument.

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Note

1. Dourdon-Taurelle and Wright 1978 use a categorization of the Jew's harp based upon the direction of the tongue or lamella in relation to the hand — pointing towards or away. This article uses the more usual Sachs system of hetroglot and idioglot.

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Excavation and Survey in Arkhangai and Bulgan Aimaqs, Mongolia July 20-August 17, 2005

For the summer of 2005, the Silkroad Foundation, in conjunction with the Department of Archaeology at the Mongolian National University, will be sponsoring excavation and survey in Arkhangai and Bulgan aimaqs, Mongolia. You are invited to join in the first season of this collaborative project.

The field directors for this project are Dr. Mark Hall (Archaeological Research Facility, University of California, Berkeley) and Dr. Zagd Batsaihan (Department of Archaeology, Mongolian National University). Dr. Hall has excavated in Bulgan aimaq in 1996 and 1998, while Dr. Batsaihan has worked in these aimaqs since the early 1990s.

The main focus of the research will be looking at Xiongnu cemeteries and possible Xiongnu settlements in these two aimaqs. For the past several years, both Dr. Hall and Dr. Batsaihan have been working on Xiongnu material in an attempt to look at: 1) trade and exchange relationships within the Xiongnu confederacy; 2) trade and exchange between the Xiongnu and Han; and 3) developing an absolute chronology of the Xiongnu. Excavations are being done in order to gather more data to look at these issues.

This program is an exciting opportunity for participants with a wide range of interests. The early nomadic societies of Eurasia played a critical role in the development of economic and cultural exchange along the "Silk Roads." As the Han Dynasty histories emphasize, of particular importance was the Xiongnu confederacy in the last centuries BCE and beginning of the Common Era (AD). Our understanding of the nomads themselves and their relations with sedentary centers has been transformed by the archaeological work of recent decades. A wealth of new material is being unearthed, and new methods are being applied to its analysis. In addition to enhancing your understanding of the origin of the Silk Roads and offering hands-on experience in archaeological field work, the program will be an excellent introduction to the broader cultural world of the steppe nomads and to the history and culture of Mongolia. The Xiongnu were only one of several important nomadic confederacies which were centered there, the best known being that of the empire which would encompass much of Eurasia under Chingis Khan and his successors in the 13th century. To spend significant time in the grasslands of Mongolia's spectacular landscapes, where many aspects of traditional herding culture are still alive (although by no means uninfluenced by the modern world), can greatly enhance one's understanding of this region's importance in world history. This is a program which should appeal to anyone eager to learn about Eurasian history and experience first-hand rich cultural traditions which are very different from one's own.

Language

The official language of the seminar is English. Lectures by local Mongolian scholars will be translated.

Dates / Sites

Part of the field season will be spent excavating at Tamaryn Ulaan Khoshuu, a Xiongnu cemetery containing over 300 burials and a series of banked and ditched enclosures believed to date to the Xiongnu era. The other part of the field season will be spent doing survey and test excavations of Bronze Age and later period sites and monuments.

Session 1 — July 20th-August 3rd, 2005

Session 2 — August 4th-August 18th, 2005

Program Fee

A tax deductible donation of $1000 for one session, or $1500 for both sessions. This donation does not include airfare, visas nor incidentals in Ulaan Bataar. We are currently investigating the possibility of a homestay with a Mongolian family upon arrival in Ulaan Bataar, but you should also considering budgeting for staying 2-3 days in a hotel in Ulaan Bataar.

Schedule

Survey and excavation will run six days a week once we are out in the field. The typical day will probably be as follows:

8:30 AM — Everyone goes to his/her excavation or survey units.

12:30 PM — Return to camp for lunch.

2:30 PM — Everyone goes back out for survey and excavation.

6:30 PM — Return to camp for the evening meal.

In the evenings, we will have some group discussions about the finds from the excavation and/or we will be cleaning artifacts. Other evenings may involve inviting the local herders to the camp, or visiting them. Some evenings will be free with no organized activities.

List of Lectures

Several lectures will be given during the session. The tentative schedule is as follows:

"Archaeology," by Dr. Mark Hall, Archaeological Research Facility, UC Berkeley.

"Archaeology in Mongolia," by Dr. Zagd Batsaihan, National University of Mongolia.

"Nomadic Culture," by Dr. Daniel Waugh, University of Washington.

"The Xiongnu," by Dr. Albert Dien, Stanford University.

"History of the Mongol Empire," by Dr. Dien or Dr. Waugh.

"Mongolia Today," by Oyungerel Tsedevdamba, Personal assistant to the Prime Minister of Mongolia.

Prerequisite

Participants must bring their own camping gear. If you want to buy (possible range from $300-500) a ger in Ulaan Bataar and live in that while on expedition, we'll help you do that.

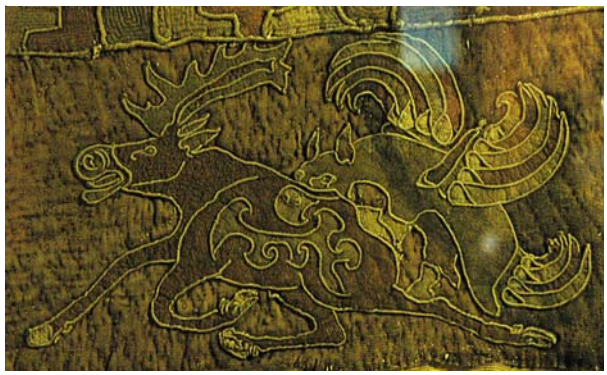
Volunteers need no special training, but should be used to physical activity and wilderness camping for extended periods of time. We are going out on the Mongolian steppe and will be anywhere from 50 km. to 150 km. from any sizable towns. We will live in tents and gers, without electricity and plumbing. Hot water will almost be a luxury. The diet will be heavy on sheep and rice, and, hopefully, cheese and yogurt. Vegetarians will not do very well with the diet.

Volunteers will be given training on how to do archaeological survey and excavation. If you have been on an excavation before, that is great; but if not, do not worry about it. The most important things you need for this project are: 1) a good sense of humor; 2) the ability to cope with rapidly changing conditions; 3) a sense of adventure; and 4) the ability to live without electricity, a cell-phone, a television and a computer.

Academic credit is not provided for this project.

Application / Deadline

The online application (http://www.silkroadfoundation.org/excavation/excform005.html) should be submitted to the Silkroad Foundation *by March 15, 2005*. We will notify those accepted by early April. For more information, please contact program director Dr. Mark Hall (mhall@berkeley.edu) or contact the Silkroad Foundation via email (excavation@silkroadfoundation.org).



Detail of Xiongnu carpet, excavated at Noyon Ula, Batsumber Sum, Tov Aimag. Collection of the National Museum of Mongolian History, Ulaan Baatar. Photo: Daniel C. Waugh, 2004.