

American-Mongolian Deer Stone Project: Field Report 2007



William Fitzhugh and J. Bayarsaikhan, Editors
Lauren Wynalda and Tori Bertsch, Producers

National Museum of Mongolian History
Ulaanbaatar, Mongolia

Arctic Studies Center
National Museum of National History
Smithsonian Institution
Washington, D.C



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Published in March 2008 by:

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2007 Field team at staging point in Muren

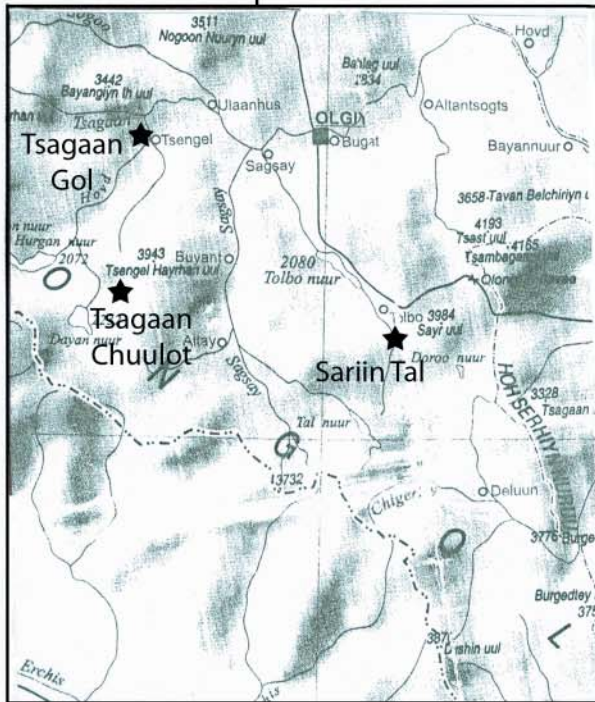
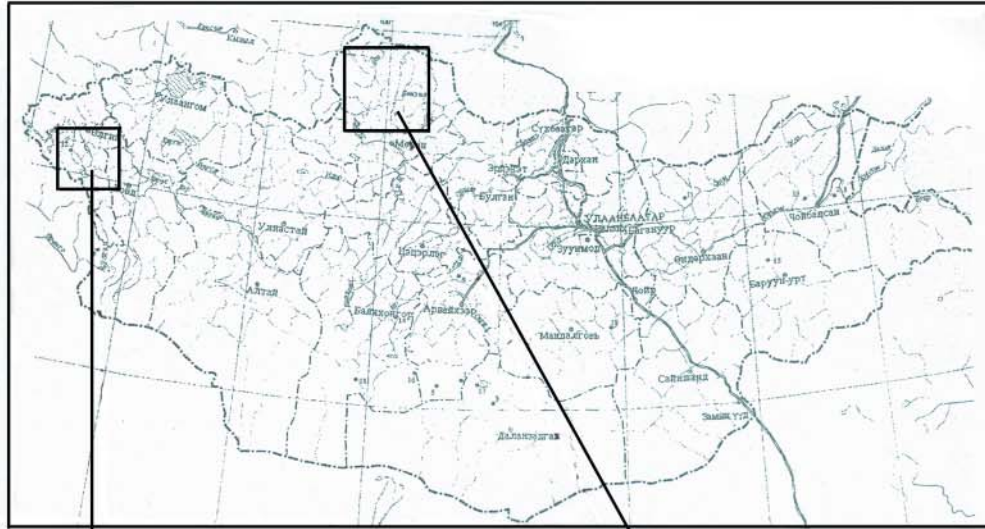
Table 1. Deer Stone Project Radiocarbon Dates from Deer Stone and Khirigsuur Sites in Khovsgol, Arkhangai, Tsengel, and Sagsai Aimags

site / feature	location/year	sample no.	material	uncorrected	calib (2-sig)
Ulaan Tolgoi DS4 S-17	Erkhel / 2003	B-182958 AMS	charcoal	2170 ± 40 BP	BP 2320-2050
Ulaan Tolgoi DS4 S-7	Erkhel / 2003	B-182959 AMS	charcoal	2930 ± 40 BP	BP 3220-2950
Ulaan Tolgoi DS4 F1	Erkhel / 2004	B-193738 AMS	bone coll.	2530 ± 40 BP	BP 2750-2470
Ulaan Tolgoi DS4 F2	Erkhel / 2004	B-193739 AMS	bone coll.	2950 ± 40 BP	BP 3240-2970
Ulaan Tolgoi DS4 F3	Erkhel / 2004	B-193740 AMS	bone coll.	2810 ± 40 BP	BP 2990-2800
Ulaan Tolgoi DS4, F5	Erkhel / 2005	B-207205 RAD	bone coll.	2790 ± 70 BP	BP 3220-2800
Ulaan Tolgoi DS4, F6	Erkhel / 2005	B-207206 RAD	bone coll.	2740 ± 70 BP	BP 3150-2780
Ulaan Tolgoi DS5, T1	Erkhel / 2002	B-169296 AMS	charcoal	2090 ± 40 BP	BP 2150-1960
Ulaan Tolgoi DS5, F1	Erkhel / 2005	B-215694 AMS	tooth coll.	2800 ± 40 BP	BP 2980-2790
Ulaan Tolgoi DS5, F2	Erkhel / 2006	B-222535 AMS	tooth coll.	2830 ± 40 BP	BP 3050-2850
Ulaan Tolgoi M1, F1	Erkhel / 2005	B-207209 AMS	bone coll.	1880 ± 40 BP	BP 1900-1720
Ulaan Tolgoi M1, F2	Erkhel / 2005	B-215692 AMS	tooth coll.	2860 ± 40 BP	BP 3080-2870
Ulaan Tolgoi M1, F2	Erkhel / 2005	B-215644 AMS	charcoal	2980 ± 40 BP	BP 3310-3000
Ulaan Tolgoi M1, F3	Erkhel / 2005	B-215693 AMS	tooth coll.	2950 ± 60 BP	BP 3320-2940
Nukhtiin Am DS1/2, F1	Galt / 2006	B-222534 AMS	tooth coll.	2830 ± 40 BP	BP 3050-2850
EvdT 2 DS 2	Circ. feat. EvdT Valley	B-215643 AMS	charcoal	3030 ± 40 BP	BP 3350-3090
Tsatstain Kh DS1, F1	Tsaagan / 2005	B-207208 AMS	tooth coll.	2920 ± 40 BP	BP 3160-2920
Tsatstain Kh DS1, F2	Tsaagan / 2005	B-207207 AMS	tooth coll.	3000 ± 40 BP	BP 3330-3060
Urt Bulagyn KYR1-21	Khanuy / 2006	B-222532 AMS	tooth coll.	2780 ± 50 BP	BP 2980-2770
Urt Bulagyn KYR1-22	Khanuy / 2006	B-222533 AMS	tooth coll.	2790 ± 40 BP	BP 2970-2780
2006-2007 dates:					
Nukhtiin Am Md1, F1	Galt / 2006	B-240685 AMS	tooth coll.	2630 ± 40 BP	BP 2790-2730
Tsagaan Chuluut K1 F1	Sagsai / 2007	B-240686 AMS	bone coll.	130 ± 40 BP	BP 280-0
Khogorgo-3, Md1	Shishged 2007	B-240687 AMS	tooth coll.	3450 ± 40 BP	BP 3830-3620
Khushuugiin Devs. F2	Erkhel / 2007	B-240688 AMS	tooth coll.	2450 ± 40 BP	BP 2720-2350
Khushuugiin Devs. F3	Erkhel / 2007	B-240689 AMS	tooth coll.	2680 ± 40 BP	BP 2860-2740
Khyadag E. DS pav.7	Erkhel / 2007	B-240690 AMS	bone/tooth	2610 ± 40 BP	BP 2770-2720
Hort Azuur DS2, L2, F1	Hort Azuur / 2007	B-240691 AMS	charcoal	2710 ± 40 BP	BP 2870-2750
Tsagaan Gol K2 F1	Tsengel / 2007	B-240692 AMS	tooth coll.	2140 ± 40 BP	BP 2300-2240#
Tsagaan Gol K3 f9	Tsengel / 2007	B-240693 AMS	tooth coll.	1740 ± 40 BP	BP 1730-1550

B-240692 Tsagaan Gol K2 F1 has a second intercept at BP 2180-2000

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Mongolian Altai



Hovsgol Aimag

PART I

Introduction and Overview

William W. Fitzhugh

The Smithsonian-Mongolian Deer Stone Project, in its seventh year of field activities from late May until early July, continued its research in Hovsgol Aimag of northern Mongolia, and in a new departure, conducted a preliminary survey of deer stone and other Late Bronze Age sites in the Altai Mountain region of western Mongolia in the vicinity of Bayan Ulgii. The project was organized jointly by the Smithsonian's Arctic Studies Center and the National Museum of Mongolian History and was sponsored by the Trust for Mutual Understanding, National Geographic Society's Expedition Fund, the U.S. Department of State's Ambassador's Fund, and private sources. The project was co-directed by William Fitzhugh and Bayaraa Bayarsaikhan (see participant list at the end of Part II).

The goals of the 2007 project extended those of recent years by combining exploration for new sites and deer stones with detailed excavation at key sites to obtain cultural complexes, dating materials, and settlement information. The basic problem focus has been to document the spatial and temporal development of deer stones, seeking information about their origins and spread, their art and iconography, the physical setting and internal structure of their sites, and their relationship to khirigsuurs and other cultural features. Surveys also extended to rock art sites that could be related to deer stones. Of particular interest was the dating of deer stone sites that have small, simpler stones, most of which have been found in the Darkhad and northern Hovsgol regions. Our surveys of the Altai region of western Mongolia were to compare data with the central northern Hovsgol region and obtain dating samples and records of the types of deer stones and their art.

The Altai survey resulted in large amounts of data from three sites: Sariin Tal south of Lake Tolbo; Tsagaan Gol west of Tsengel; and Tsagaan Chuulot, southwest of Sagsai. Excavations were conducted at Sariin Tal and Tsagaan Gol, and all sites were mapped. A human burial was excavated from a satellite mound at Tsagaan Gol, and mapping revealed Tsagaan Chuulot to be a very large deer stone site associated with three khirigsuurs. Some Altai deer stones were found to be very similar the granite and diabase stones of central Mongolia, while many were made of a softer greywacke or slaty rock and had similar designs and motifs. Preservation of the latter stones was poor and many were covered with modern graffiti.

Hovsgol produced a large amount of new data from Khogorgo-3, Avtiin, Hort Azuur, Khushuutiin Devseg, Tumst, and Khyadag. Khogorgo-3 turned out to be a late Neolithic or Early Bronze Age site with abundant flint tool production (microblades, small points, scrapers, blade cores, and thin stamped types of pottery) and a large circular pavement with a burial in a shallow pit in the middle of the pavement. Early pottery and flints were found throughout the pavement and pit. Avtiin's satellite mounds produced no horse heads, nor did excavation of three conjoined small mound pavements east of DS 3 at the Hort Azuur site. Frustrations were experienced at these sites in the general absence of firm associations of datable materials with satellite features. However, more success was obtained at Khushuutiin Devseg, where we excavated three stone features, two of which contained horse remains and large amounts of ceramics. A buried deer stone increased the DS sample here to

three. Three deer stones were also documented, and rock pavements were excavated at Tumst, and detailed mapping and excavations of a rock pavement at Khyadag produced many animal bones samples associated with the pavement which should be at this feature in the eastern DS group. Here we also discovered many small deer stones with minimal but classic DS markings.

The 2007 season produced important new information and will allow us to gain a much better picture of the chronology of deer stone development, the geography of DS art variation, and our first comparisons with the much-diminished deer stone activity in far western Mongolia, where khirigsuurs, also are present but in smaller numbers and with different forms than seen in central Mongolia. Here the damage to slate/greywacke deer stones is severe as a result of a combination of massive breakage of the bodies of the stones as well as great damage from modern graffiti. Unlike the Hovsgol deer stones the grey stones of the Altai have more small carvings of animals like ibex, sheep, and others independent of the central deer motif system. Another important observation was the scarcity of horse burials associated with deer stones and khirigsuurs in this region of Mongolia. Excavations at several stone pavements or low mounds found in easterly positions outside khirigsuur fences produced no artifacts or horse remains, but in one case we discovered a human burial in a slab cists were found instead. By contrast khirigsuurs often had abundant open hearth circles spaced around the perimeter of the fence walls, similar to features found in the Hovsgol region.

Deer Stone Orientation Experiment

Bill Stewart, a member of the 2007 excavation team, has done calculations on the Sunrise Azimuth on Winter Solstice in the Morun area, and the deerstones seem to be facing the sunrise on the winter solstice. It's around 130° (flat ocean horizon) to 140° (7° above the horizon, for mountains) off North, depending on how high off the horizon the mountains are. It seems the stone "people" face the rising sun at winter solstice.



Visiting herders at Avtiin Site

PART II

Mongolia Field Journal 2007¹

William W. Fitzhugh
Arctic Studies Center
Smithsonian Institution

Introduction

The sixth season of the Arctic Studies Center's Mongolia Deer Stone Project took place in the Altai region of western Mongolia and the Hovsgol aimag of northern Mongolia during 24 May and 27 June 2007. This year's project had three goals: (1) conducting a preliminary survey of deer stone and khirigsuur sites in the Bayan Ulgii Altai region of western Mongolia; (2) continuing research on deer stone sites in Hovsgol aimag in northern Mongolia; and (3) conducting a research symposium on Bronze Age sites with American and Mongolian colleagues in Ulaanbaatar. The following is a near verbatim transcription of my field journal for the project. Because this area of the world is so little known, I include here much that is not directly relevant to the archaeological work, but may be of interest to others in terms of geography, ethnology, and environment, or simply, the operation of a scientific expedition to this part of the world. The project was made possible by organizations and individuals noted in the acknowledgements at the end of this document.

24 May -- Ulaanbaatar to Bayan Ulgii in the Mongolian Altai

During our flight from Ulaanbaatar to Bayan Ulgii our plane refueled at Tosontsengel—a town that was established as a production center for furniture and woodworking during the Soviet period and which happens to be the oldest place-name in Mongolia. While we gassed the plane a strong wind buffeted us on the runway amidst bright sun and puffy clouds. It was a gorgeous day.

We arrived in Bayan Ulgii (meaning 'rich/good cover', as in 'tent cover') at 5:00pm and met Svetlana, Adiya's tour associate here, and our driver, Berikhol, who speaks a bit of French, but little English. When we appeared at the police station to register for our travel, we found they had gone fishing until tomorrow morning, so we couldn't get our travel permits into the border region and instead went shopping in the open market.

This area of Mongolia is occupied primarily by ethnic Kazakhs, and their different culture is everywhere apparent in the flat-top mud brick buildings with timber poles sticking out and stuccoed walls, making them look like Pueblo structures in New Mexico. Each village also has its small mosque, although religion here is a moderating rather than a driving force as in Islamic countries to the west. Kazakhs don't mix much or marry out, unlike Mongols, says Amraa, our interpreter.

Our departure that evening from Bayan Ulgii had not been auspicious. Berekhbol's van had broken down on the first hill rising south of town, and we were stranded for several hours while he fetched a new fan belt. But we eventually reached our first evening camp late in the night of the 24th on the north side of Lake Tolbo Nuur, a large fresh water lake that also gives its name to the local Sum, or

¹ This expedition log has been transcribed by Lauren Wynalda during an internship at the Smithsonian's Arctic Studies Center, National Museum of Natural History (fall of 2007).

administrative center. The hill west of our camp is called Ulaan Tolgoi. There is good fishing in the lake, and many cabins were located at the narrows between its two wider ends. When we arrived it was late and I thought it was too windy to set up my tent. I miscalculated that it would not rain. It did; but I managed to keep relatively dry by covering myself with tent material. In the morning we wandered around the shore and found a small sheep pen with lots of broken porcelain electric insulators scattered in the dirt (why?). There were several stone mounds on the hillside and one by the lake shore (GPS 246), as well as a stone slab (247) and khirigsuur (248) which we visited in the intermittent rain on the morning of the 25th. The snow line had descended two-thirds down the hillside to the north.



The inside of Bogdat's ger, a Kazakh-style construction variant of the Mongolian ger. (Photo: Bayarsaikhan)

GPS 245 (7121 ft asl; N48°35.409'; E90°03.838'). Ulaan Tolgoi (oddly having the same name as our Erkhel site near Muren), located on Tolbo Nuur, was our first overnight camp, where in the morning we found a stone corral up against the hillside.

GPS 246 (1035'; N48°35.328'; E90°03.955'). Rock and earth mound near the lake shore, approximately 10m in diameter. A line of stones one meter north of the mound extends west to the cliff.

GPS 247 (7066'; N48°03.384'; E90° 04.240'). A 1.3m high stone slab set in rectangular slab setting. According to a local herder we met here, this is only half of the original stone, which is made of variegated granite with a large crystal grain.

GPS 248 (7160'; N48°35.761'; E90°04.365'). A stone slab with an irregular shape, 1.5m tall, found on the west side of the road.

GPS 249 (7150'; N48°35.781'; E90°04.516'). A khirigsuur with 2-3 small satellite mounds, and an exposed paved plaza.

GPS 250 (7088'; N48°35.781'; E90°04.516'). Small slab graves, and small mounds, dating from recent times to 200 years old (?). Thin slate slabs, 10-12 features in a 20x30m area.

GPS 251 (7425'; N48°22.453', E90°22.919'). "Windy Pass" area with 8-10 square and round khirigsuurs clustered around the east end of a ridge where it meets the steppe. Some standing slabs present. The wind was howling through this valley when we passed through.

GPS 252 (7616'; N48°21.349', E90°26.468'). Deer Stone site at Sairiin Tal ('Small Stones

Steppe’). The archaeologist Bayar recorded and published two stones from this site from field work in the 1960’s. He did not excavate and missed many details. The mountain north giving the site its name was turning white with snow as the day progressed, and a strong north wind and snow flurries made work here more than invigorating. I felt like I was back in Frobisher Bay, Baffin Island.

After initial work at Sairiin Tal we returned to the summer home-
stead owned by Bogdat 2km west of the site and asked if his wife would prepare lunch for us, using our food. Bogdat has a blond little girl and a couple of brown-haired boys. The adults have longer and larger noses (say the Mongols!), light-colored eyes, and lack Mongoloid physical features. Their camp has big mud-brick sheep



The Sairiin Tal (trans. ‘Small Stones Steppe’) deer stone site on a cold and windy day. (photo: Bayarsaikhan)

pens. Bogdat told us they winter in the forest about 100km of here. Their ger is larger than most Mongol gers and has many differences – a larger and less substantial center ring and thinner roof poles with thinned, flattened lower ends that bend down around the edge of the roof. The poles are each wrapped with colored yarn, making Kazakh designs. There is no ‘altar’ opposite the door as in Mongol gers; rather their place of honor is in middle of the left wall upon entering. Colorful Kazakh wall hangings and a whole cloth inner roof cover with a spiral embroidered band, and a woven strap extends from the top of the wall to the roof hoop and down the other side in north-south orientation. There are also no standing poles in the middle of the tent as in Mongol gers; just two bracing sticks with forked tops. Embroidered bands with white hair puffs at each end laced thru the roof poles at the north and west sides, with yellow puffs over door (east). Some good luck ritual, probably. Everything in the décor is a riot of color and (sometimes) clashing designs, in rugs, wall panels and hangings. I video-taped the interior.

Sairiin Tal site has four large irregular-shaped stone slabs, two that have bases which are still in situ and seem to have broken off – perhaps purposefully. The granite deer stones are different. One of the southernmost greenstone slabs may show part of a deer antler and its rump marked in the stone, which is almost too hard to cut or hammer into. Possibly there are two phases of activity at this site – the greenstone phase being the latest, and without characteristic deer stone markings. Bayaraa traced the granite stone markings on plastic sheeting. One small excavation we did merely exposed the hole of a former greenstone standing slab, surrounded by a ring of “standing” rounded granite rocks, deeply set, and inside was a setting of smaller stones used as fill material. The pit in the center had glass and cement in it, but there was also a rodent burrow which might have introduced this material.

GPS 253 (7599’; N48°21.406’, E90°26.569’). At Sairiin Tal, there is a khirigsuur north of the deer stone site consisting of two stone mounds in ‘one’ with a circular rock feature along its east side of

the stone mound, surrounded by a 2m-wide circular fence ring. 18m from the fence is a vertically-set stone, from which the center of the mound bears 280°. A line of rocks extends 275° from the center of the southern mound to a double-ringed cobble feature, and a 10m diameter mound bears 230° from the southern center mound.

GPS 254 (7387'; N48°21.076'; E98°25.276'). There is also a large khirigsuur south of the deer stone site with a double-mounded central mound with radiating lines to east, west, and northwest from the center to a 1m wide circular stone fence, and 9-10 small oval stone rings outside the fence from south to west sector. Bayara made detailed notes of this and the preceding (253) site.

GPS 255 (7368'; N48°21.516'; E90°25.069'). A row of small square khirigsuurs, about 6m long on each side, with corner slab uprights.

GPS 256 (7361'; N48°21.619'; E90°25.288'). Group of round and square khirigsuurs.

We had supper cooked by Bogdat's wife, using our contributed food. She made really good fried pastries. We took some pictures of the three kids in the house and of the women milking the sheep. They had a pen full of cute little lambs which were bleating because they wanted to be back with their mothers. The kids loved to pose with the lambs. We left about 7:30 with beautiful evening light finally chasing out the cold north wind and snow clouds from the hills, which were now blanketed in white. The sun was setting right into our face as we drove. We stopped briefly in Tolbo, the sum center, to get the magistrate to sign our excavation permit since we had worked in his sum area.

From there we drove to Bayan Ulgii, arriving about 10:00. Once again we could not find the police to sign our border access papers. Last time he was off fishing; but it was now late Friday night and we would have to wait for morning. We found a 'good enough' hotel with a group room for five and a bathroom, but no hot water unless you wanted to pay for a 'sauna'. A bunk was just fine with me after spending last night sleeping in the rain.

26 May 2007--Bayan Ulgii to the Mountains Southwest of Tsengel

Bayan Ulgii is a Soviet-style city with ugly concrete buildings and dusty streets full of potholes – the latter not a Soviet specialty, to be sure! Today, as we wait on the stoop of the hotel for our driver, Berikbol, the sun is warm and people are watering spindly sprigs of young trees in their postage-stamp-size, sandy, soil-less front yards trying to coax them to life in this harsh and almost tree-less region – a considerable challenge. Whenever you do see trees they are behind iron fences to keep them from being eaten by the cows that wander freely in the streets. Opposite our hotel is the city culture palace, a gaudy brown structure with white concrete pseudo-pillars designed as a pseudo-ger with ger lattice trim design. But the



Our driver Berikbol's family at their home in Bayan Ulgii.

workings of the town are excellent – lots of shops and some nice restaurants, a good black market, and a government that seems to work. What is strikingly different from the rest of Mongolia is this region's Kazakh culture, its architecture (very few gers), and its Islamic religion, with mosques; but it is apparently a very secular variety of faith. In the park opposite the police station we have seen each day many men dressed in traditional Mongol gers with orange belt sashes practicing archery amidst chanting and cheering. Berikbol told us it was a provincial archery championship that lasts for 3-4 days.

At 11:00AM we finally got our border permission and left Bayan Ulgii at 12:30, after tea at Berikbol's home, where his beautiful wife Aishagul showed us some records and photos of stone monuments from the Bayaan Ulgii museum where she works. Unfortunately we will not be able to visit these places during our trip, which is in a different direction. She showed me a photo of a guy named 'Jim' who has been coming here for the past few years collecting artifacts or antiques – perhaps a dealer – wondering if I knew him.

The mud bricks used for house and wall construction here are made with a special mud mixed into



A grave construction at the Muslim cemetery in Tsengel, whose raised corner stones is reminiscent of stone pillars found at the corners of many Bronze Age Khirigsuur mounds. (photo: Bayarsaikhan)

a grout of gravel, sand, and water. They are laid up in walls with cement. Roofs are flat and are made waterproof by putting stove ashes on top; it seems the rain turns the ashes into a cement-like waterproof surface.

GPS 257 (7236'; N48°58.525'; E89°16.923'). Gurvan Khaar Pass (Davaa) near Ulaan Oos, a town west of Bayan Ulgii, near the Khovd River.

GPS 258 (7236'; N48°58.510', E89°16.809'). Gurvan Khaar Khirigsur. At our first high pass after leaving town, where patches of snow still lingered, we found

a beautiful khirigsuur. It was strange to find a khirigsuur on such a high pass with so many feast circles, about 16 (maybe more?) ovals outside its fence.

At Tsengel, the sum center west of Bayan Ulgii, we filled our gas tanks. Tsengel is a pretty town with a small mosque and large, carefully maintained trees, located at the confluence of the Tsagaan (White) and Khovd Rivers. At **GPS 259** (XXXX) we had lunch alongside the Khovd River, at a large grass-filled stone enclosure meant to keep animals out in summer so that forage can be reserved for winter use. Earlier we had seen a huge stone enclosure just east of the town of Tsengel. During the winter these pastures allow people to keep their flocks closer to their winter dwellings.

GPS 260, 261??

GPS 262 (6874ft.; N48°39.396'; E88°37.879'). A Turkic stone setting with both stones broken in half.

GPS 263 (XXX) A perfect khirigsuur for a perfect evening. So far, we've only seen oval features with the mounds, not a single horse burial feature, and many circular khirigsuurs, but no square ones. There are impromptu irrigation ditches winding all over the place in this part of the valley. It seems that they are intended to spread water as far around as possible to promote grass growth for the horses and flocks.

GPS 264 (6890'; N48°43.989'; E88°33.109'). Two possible deer stones - eroded and without clear markings and two mini khirigsuurs to the south.

GPS 266 (8300' -- 8140' below hill; N48°49.667', E88°40.426'). High pass (265 was deleted).

GPS 267 (7469'; N48°50.187'; E88°42.891'). A small Turkic balbal statue in front of a stone slab box about 2x2m on a side.



Turkic grave north of Tolbo, the sum center near Tolbo Nuur. (photo: Bayarsaikhan)

GPS 268 (7028'; N48°51.284', E88°44.510'). A Kazakh spring camp. It was nearly dark when we began having trouble with the accelerator and stopped at a small herder's camp. An old lady came out to greet us hunched over and supporting herself with a cane in each hand. All the others in the family were putting the sheep in for the night. Her house was a small one room log cabin with a down slope tilt and, like the matron, looked very old: cement-chinked logs with stirrups and other gear hanging on the walls. She led us inside into a completely black room with only a trace of heat. At first it seemed we were barging into a sad poverty-stricken family that couldn't afford to entertain surprise guests but of course would anyway, as required. But after we were all inside with her, helping her with one of our flashlights, she reached a light bulb and turned it on and all of a sudden we were in the middle of a nicely-decorated home with Kazakh wall hangings, a stove that soon started to crackle, and a Kazakh dombor stringed instrument in the corner. She cooked up tea, found pastries for us, and as the rest of the family finished their chores we were sitting around a small feast. The grandmother is 72. Her son and his wife as well as their three young boys were also present. They have a solar collector that stores enough power to run a radio or TV all evening, if it's been a sunny day. Some small dombor numbers were played by the father, who was a checkers and chess finalist in a recent sum competition. Our artist colleague, Boldo, lost handily at checkers. After a while we supplied more food, and they brought in an armload of what looked like dried lamb and dumped it into the pot, and added our potatoes. While this was going on the kids were over-dosing on the nearly two pounds of candies we had given the family.

Reflecting on what we've seen so far, there has not a single horse burial feature associated with a

khirigsuur, despite the presence of many feasting ovals. This suggests that horses were precious here and could not be offered as burial gifts, whereas in the 'horse-rich' ecology of Central Mongolia they could be spared in abundance. In other words, social feast offerings honoring the dead were seen as more important than horse offerings. The khirigsuurs in the high valley (GPS 263, 264) were large, numerous, and well-made. This looks like a very rich part of the country. In later afternoon we had a great viewing of camels against the alpine mountain backdrop gleaming in the evening sun. There are lots of Turkic graves also, and many with balbal figures.

During the afternoon we had passed a small mining operation after lunch on the west side of the river where they were mining a mineral or metal used in light bulbs. There were lots of jeeps around and the open mines and tracks went high up the side of the mountain nearly to the summit. There were many 'Turkic Stone' settings in this portion of the valley as well as many irrigation ditches to carry water for expanding grass production. I've never seen ditching like this in Central Mongolia, but maybe it's important here where everything depends on capturing the highly seasonal spring runoff and getting water to reach larger areas than just the river banks.

Dinner was wonderful when it was finally ready at 11:30 – potatoes, carrots, rice stew and lamb that had been salt-seasoned and hung for about three months. It was boiled and then cut by the host, Morelii, into small strips for us. Desert was tasty sheep yogurt. A fine meal and they really went to an effort for us. In the morning, after camping next to their sheep pen, where he kept a single horse, we had breakfast and hosted them to peach juice, bread and jam and ate more of their fried finger bread and sweet cheese curds. Our hosts here were: Sayagul, the grandmother; Jamal, the wife; and Moralii, the husband. Jeldashar is their camp name, meaning windy place. It was calm during our visit, but I'm sure is well-named as we are up in some pretty high mountainous country, whose advantage for herders in spring and early summer is the abundant high altitude snow-melt.

The night was clear and cool, getting windy by morning. In the evening we were hearing horror stories about the bad road ahead to the big deer stone site, Tsagaan Denj (White Small Hill), and about the impassable river ford and lots of mud. It seems clear that we can't get there from here, and the alternate routes are all either blocked by snow now or are too far away in lands lacking gas stations.

27 May 2007 (High Pass Overlooking the Tsagaan Gol, or White River)

GPS 269 (7818'; N48°55.946'; E88°42.968'). Gorgeous view of the black-green mountains with the Tsagaan Gol winding its way far down in the valley below. It was blowing hard at the pass. We decided not to waste the time and fuel to try and get there, but rather sat for thirty minutes enjoying the view, sheltered below the lip of the pass from the gale of wind.

GPS 270 (7582'; N45°50.038'; E88°43.309'). Turkic house 4x4 m. square. We found a potsherd here with doubled wavy lines and a zig-zag design on it; also a group of small Turkic graves and offering sites.

GPS #271 (6758'; N48°43.402'; E.88°39.486'). Two heavily eroded slabs of granite, one 1.5m tall, and the second broken in half. There are no signs of deer stone marks or external features, so this is probably not a deer stone.

Crossing the river north of the glacial outwash terraces we came to a bridge toll where the keeper asked us to fill out a questionnaire about how we had planned our trip and what amenities we de-

sired! This was quite a shock, given the circumstances of the trip and the complete absence of any tourist facilities anywhere, other than bridges – which in fact are superb and far better than anything I have seen in Hovsgol aimag. I suspect this has to do with the road connection they are trying to develop here with China for economic development; but of course its great for tourists and researchers as these rivers would have been impassable otherwise.

In Tsengel we had lots of trouble finding a truck to haul the van across the river Khovd. The deer stone site is supposed to be only 6km west of the river, on the north side of the Tsagaan gol. Finally the ambulance driver agreed, but he cautioned us that if he had an emergency he would not be able to pick us up for a while. About four-o'clock we crossed the Khovd towed by a light truck carrying Bayara (who filmed us – “in case we drowned,” he said) and a young calf that needed to get to the greener pasture on the west bank. Water rose up to the floor of the van but no higher, and we stayed dry. It only took fifteen minutes to drive down the high south terrace of the Tsagaan Gol before two deer stones rose up in the distance beside several large khirigsuurs, near a complex of modern Kazakh cemeteries. It seemed surprising at the time that these were real deer stones, like those at Ushkiin Uver in Hovsgol aimag. One has a face just like #14 at Ushkin Uver, carved in granite and quite eroded, but with a circular ear and belt with some faint images of hanging tools, as well as a deer on the torso. The other stood cheek-by-jowl, touching it to the east, made of a slate-rock that showed a circle at the top and deer figures up and down its south side, but difficult to decipher as the images were faint. The strange thing is the conjoined setting right in the middle of a heavily-constructed khirigsuur, giving one the impression that this was not their original setting; also they are set at an angle to one another rather than squared to the east as most stones are. Another large khirigsuur was 10-20m to the east. Four to five others nearby, all circular types, are set at the front of a clayey terrace overlooking the Tsagaan Gol, from which they are now more than a kilometer distant but were probably close to the river when they were constructed. All are made with large granite boulders and have low central mounds and single rock fences. We noted several stone circles and two small external mounds that look like horse head burials, made with large granite rocks. The fences are made with single rocks, not mounded or double rows like many of the khirigsuurs we've seen in this area. Also, there are no inner plaza stone lines with cardinal directions. All of this suggests to me two khirigsuur styles, with chronological or cultural differences between the two forms. The deer stones and their set of khirigsuurs are really identical to the Hovsgol types and should date to the same period. I would really like to know the age of the wide-ring, multiple-row type, which seems to have a western distribution from here into Kazakhstan and Russian Altai.



A Kazakh we encountered along the Khovd River.
(photo: Bayarsaikhan)

Amra and Onlo cooked a great noodle stew with our packaged chopped “beef” (which tastes like it’s really lamb – no surprise there!), potatoes, and onions. Not quite as good as last night’s home-cooking, but fine anyway. The rain was falling

steadily now and probably is here for the night. We're camped in a grassy meadow with old larch trees, between the hill slope and the river Khovd. There are two herder families nearby, and their kids came calling. My bath, half in the rain, aroused more attention than I imagined, but I desperately needed to do something along that line.



*A pair of re-positioned deer stones in the center of a khirigsuur (K3) at the Tsagaan Gol site near Tsengel, western Mongolia.
(photo: Bayarsaikhan)*

28 May 2007 (Tsengel, Khovd River)

We were up at 6:00 for a long day of digging at the Tsengel deer stone site. It rained and blew hard much of the night, so I hope the river will not be too high to cross tonight; but at least it had cleared and was cool and windy in the morning.

GPS 272 (6124'; N49°00.045'; E89°05.114'). The Tsengel deer stone site. This region is called locally "Khoshuut", or 'Deer Stone Valley Place'.

GPS 273 (6154'; N49°00.45'; E89°04.951'). 10 circular and square khiriguurs with corner posts west of deer stone site.

Khirigsuur 1 (GPS 274: 6164'; N49°00.122'; E89°05.077') at the Tsengel Deer Stone complex (northernmost) is circular, with a single double-tiered rock granite boulder wall; rubble plaza; rubble central mound 30cm higher than plaza. 20 diameter fence. 7m diameter center and one possible external stone ring. The khirigsuur is about 1m higher than the eroded clay ground surface surrounding it. No exterior satellite mounds; no plaza stone lines or internal plaza features.

[NOTE: Bearings marked * have been corrected from the initial readings in my field notes by adding 30° to account for a difference I noticed between the GPS bearings and a regular compass bearing. My GPS had not been compass-corrected when these readings were taken.]

Khirigsuur 2 (GPS 275: 6157'; N.49°00.075'; E89°05.115') is 110 paces (meters, more or less) and *35° to K1; *176° to K3 (the deer stone khirigsuur); *130° to K5; 170° to K4 (next to deer stone); and *160° to K6. K2 is a 20m diameter khirigsuur with single rock, large boulder fence wall (granite). The rubble plaza and central mound is about 25cm higher than the plaza. The mound edge is bordered by large, 50cm boulders. Three large burial chamber slabs are exposed at the center of the mound. The mound is 10m in diameter. Feature 1, a circular stone satellite mound (3x3m diameter) at GPS 281 (6168') N49°.00.075, E89°05.125 had a pottery shard at its southeast edge. It is found 075° from mound center and turned out to be a human burial (see below). There is a boulder cluster at the NE edge of the center mound. There are no other internal plaza lines or features. There are no ovals/rings.

GPS 276 (6157'; N49°00.058'; E89°05.147'). Two possible horse mound pavements, each 5m diameter, adjacent to each other in N-S orientation. *333° to K2; *275° to the deer stone in K3.

GPS 277 (6158'; N49°00.055'; E89°05.119'). Four boulder rings 2m in diameter, large boulders; 3 other boulder features in vicinity.

Khirigsuur 3 (GPS 272, see previous note for GPS location of K3 (deer stone) has a heavy rocked fence with half-rocked wall (not tightly spaced rocks), perhaps tiered in two levels but now collapsed from erosion. There is a large rock rubble plaza (10-30 cm rocks), but no central mound, rather the two deer stones are placed there. *360° to K2; *110° to K5; *196° to K4; and *310° to F1 satellite mound. This stone feature was excavated with nothing found. 8.3m from deer stone to NE corner point of F1 excavation. 8.14m to SE excavation point. [this is the end of GPS-corrected readings; following are regular magnetic compass bearings]

See field notebook sketch map, p. 37 [I assume these are correct compass bearings not to-be-corrected GPS bearings]: Features at K3: **F2** is a 4m diameter large boulder cluster; **F3**, a boulder at 16.5m/044° to deer stones; **F4**, boulders 17.5m/076°; **F5**, a single boulder 16.6m/083°; **F6**, 2 boulders, 19m/090°; **F7**, a 10 boulder feature 12-16m/117° with southern edge being an alignment of 095° of 7 boulders; **F8**, large oval boulder feature with west end at 7.5m/095° to deer stone, north edge at 9m/205°, east edge at 8m/235°, south edge at 5.5m/205°. This feature (**F8**) looks like it might be another horse mound. We found a small piece of calcined bone on the surface here, probably related to the horse tooth from F9; **F9** is an horse tooth (old) at 5.5m/242°, outside a marmot hole [quite weathered (taken as C14 sample)] at outer edge of fence wall; **F10** = Volcanic grindstone 10m/000°; **F11** = satellite mound 10.5m/346° next to/outside of K4 fence wall, 2.5m diameter. **F12**, 5 piled boulders 220°/20m from center K4; **F13**, 1-3 piled boulders 25m/205° from center of K4 (probably moved recently as these features are in the vehicle “road”). **F14** is 225°/50m from K2 center. Two circular rock pavements, each 3m in diameter in north to south alignment 60m/220° to K3 deer stone; GPS #282 6150' N49°00.059', E89°05.145' We found several types of Bronze Age ceramics around and on this feature.

F11 Full excavation of this feature produced charcoal and burned bone fragments below the top rock cover, and when we excavated below, more of the same, and squirrel holes, including a piece of charred and unburned wood, raising a question about the age of the charcoal. No horse head was found below that; so it's possible this feature is just a feasting hearth. Its position was not right for a horse mound since it was not on the east side of a khi-rigsuur. It is northwest of K4 and south of K3. **F15**, an open ring of boulders 210°/50m to K3 deer stone; 130°/39m from K2 center.



Slab-lined human burial at Khirigsuur 3, Feature 16 (Bayara's K2, F1) beneath a circular stone mound resembling horse burial features in the Hovsgol region. Trowell points North. (photo: Bayarsaikhan)

Feature 16 is a stone mound east of K3, 1m outside the fence. We excavated this feature thinking it might be a horse mound and found large rock slabs 75-1.25m wide beneath upper level boulders, 50cm below surface. Below the slabs we found a small punky piece of wood. No squirrel holes were evident and it seemed an intact feature. Below, inside a stone slab box enclosure, we found a toe bone or phalange, and then a human skull.

Khirigsuur 4. A circular khirigsuur east of K3 (GPS 280: 6161'; N49°00.27; E89°05.024'), 17m diameter, with mound center compass 325° 22.5/228° GPS [check] to K3 DS; 19m/325° to north K4 mound edge; 27.5m/325° to south mound edge. Large boulder fence rocks, mound center has 1m wide boulder border band. Rubble mound interior with no rock mound cover; plaza has no rubble floor. Some rocks missing (taken) from south fence wall.

Khirigsuur 5 (GPS 278: 6160'; N49°00.014'; E89°05.218') has a compass bearing of 095° from K4. 33.5m/325° to south fence wall; 125 paces (meters) from K4; 50m fence diameter. Small round river rock and rubble plaza pavement (mixed with angular rocks like K1-4). Wall is loosely spaced granite boulders on top of a 1m wide foundation of cobbles, raised 1m wide pavement radial oriented 280°/100° (the only radial line edged with boulder border rocks). Central mound has doughnut shape with depressed interior .5m deep. East side radial pavement has 1m wide granite boulder pavement. North and south radial 1m wide pavements are exactly 000°/180° from mound center. External boulder ring feature 030°/43m (2.5x2.5 m. median).

Khirigsuur 6 (GPS 279: 6158'; N48°59.978'; E89°05.160'), 101m/paces from center of K5, is a round khirigsuur; 045° from K6 to K5; 290° from K6 to deer stones, 108m/paces. Low rubble, sharp rock, mound with little rubble plaza floor. Center mound 8m diameter. This khirigsuur is 22m diameter with double rock fence wall. No internal plaza features or lines and no satellite mounds or rings.

A herder stopped by and explained that during the Soviet period they took all the mound stones off these khirigsuurs, and those nearer Tsengel, to make bridge abutments and foundations. That's why the ones we're working on are flat centered mounds; this may also explain the strange mounting for the two deer stones.

GPS 283 (6233'; N48°59.913'; E89°04.323'). There are 8 khirigsuurs in the valley south of the Tsengel DS site. **Deer Stone 3** is at the north corner of this valley, protected by hills to the north and west. This granite DS has an angled top surface, is eroded, and its markings, if any, are not clear; but there is a possible ring/disc 4cm diameter on the lower south face; 20m from granite hillside, 15m SW of a herder's camp with three log structures.

Tsengel Deer Stone 4 (GPS 284: 6199'; N48°59.810'; E89°04.403 284') is in a 'marmot minefield' – a maze of marmot holes that so closely spaced that our van tires almost got mired in to collapsing burrows.) A large 65 inch high granite stone with ring circle on the south side 2/3 to top. There are boulder/slabs around its base. Two granite boulder lines, each 6m long and 1m wide, stretch to the east of the deer stone, parallel to each other, 9m apart, each with a 1m diameter boulder ring feature at the west end of the line.

GPS 286 (6188'; N48°59.995, E89°04.890'). While hiking up into the hill behind the Tsengel site I

found a possible 2.5m long deer stone quarry blank in soil at base of hill on the southwest side. Also a possible granite quarry and other sites.

GPS 288 (6410'; N48° 59.978'; E89° 04.808') On top of the hillcrest southwest of the Tsengel deer stone site I found a stone pile 12m in diameter with an iron horse shoe next to it. This is a modern horse shoe according to Berekhbol, our driver. Most Mongolian horses don't use iron horse shoes. Ten to 15 mostly square khirigsuurs along the edge of the terrace next to the base of the hill; no stone mounds on them and some central burial capstones are visible. Many have pinnacle corner posts. It was too dark to photograph and GPS and my batteries were too low. Bayaraa completed the K2 F1 burial excavation at 9PM in the dark and we back-filled until 10. He thinks the person was an adult Europoid, with relatively long, narrow face. No grave goods at all (not uncommon) for a Bronze Age burial. Bone condition was variable. The face and body faced south and head was to a little west of north. Burial was flexed with knees drawn up 90 degrees (thighs) to the spine and arms flexed in front of the chest. The slab-lined coffin was about 1.5m long and 80-90 cm wide.

29 May 2007 (Tsengel – Khovd River)

We camped at the same campsite as last night, in the cow/yak meadow near the river, and cooked a rice dinner, during which I got kissed on the mouth by a drunk Kazakh who climbed into our van looking for booze. The night was so cold the small water ponds froze, and it was chilly even in bed wearing long-johns. The morning was beautiful. I had a bath in the river from a grassy perch. Almost perfect except for the water temperature (snowmelt!). Yesterday one of the many horsemen to visit the site was a self-assured young man with a confident approach who rode up as we were having lunch in the rain. Turns out he has had lots of education and is involved with an international project on local wildlife conservation and tourism development. There are great opportunities (though we did not see wild animals with the exception of many birds), but there are argali sheep and rare species in the mountains. It would be great canoeing and kayaking as the rivers are fast and without many serious rapids and falls.

Amraa steered the van across the river as Berekhbol had gone across in a different vehicle to search



Ornamented saddle from 'grandfather's time' owned by a Kazakh eagle-hunting family south of Sagce, the sum center south of Bayan Ulgii. (photo: Bayarsaikhan)

for another truck in case our ambulance driver from yesterday did not show up. We saw him cross to our side earlier but instead of coming to us he headed west up the valley toward our site, moving a family. He showed up at 11AM and we had a wild ride across the river, which I tried to film from the bouncy bed of the truck, alongside a sheep that was clearly uncomfortable with both the ride and my presence.

In Tsengel we registered our work with the sum officials. The town was bustling with activity, its dusty gravel grid of streets and shops without signs, buildings all flat-

topped with timber ends jutting out beneath their roofs. Men were all in dark clothes as in Russia, and women were walking hand in hand. Everyone was out enjoying the warm calm weather. Most people are quite different physically from Mongols with faces that are longer, have larger and longer noses, and in stature appear thinner and taller. The existence of such strong differences is surprising given the thousands of years of Mongol/Kazakh geographic proximity. All this is interesting considering our burial find and it's "Europoid" appearance, 3000 years ago. Even today Kazakhs do not mix much with Mongols, who have different religion, customs, social, and marriage preferences; yet there is no sign of hostility or even reserve in their relations with our Mongol group; in fact it's quite the opposite. Many Kazakhs prefer to live in Mongolia while utilizing a land and a way of life that is more similar to the Kazakhstan Altai. Many moved here from Kazakhstan during Soviet times and more recently. Perhaps it's just this kind of accommodation and cooperation that has allowed the two peoples to co-exist successfully for thousands of years. It's quite different than the view from the west that such a culture, religious, social, and linguistic boundary should be a zone of perpetual conflict such as we have today in many areas of the world. This kind of thinking created the sensation of the Caucasoid cemetery in Western China which was excavated by the University of Pennsylvania archaeologist, Victor Mair, whom I met this last month at Paula Sabloff's symposium. You see very few delts and orange sashes in Tsengel. It's mostly Western dress and quite a few cowboy hats and lots of "Sam Sneed" visor caps.

Driving east between Tsengel and Bayan Ulgii we passed the relic 'Red Head' volcano north of the road, and took pictures of it with a farmstead in the middle view. There were lots of khirigsuurs along the south side of this broad, well-watered 'Green Valley' ('Jikh' in Kazakh) with thousands of cattle. We stopped for a pre-arranged visit with a family our driver knew whose elder was a famous eagle-hunter and still keeps a bird, now mostly to show to tourists rather than for hunting in the traditional Kazakh fashion. They showed us an old silver-decorated saddle, originally owned by the



The eagle-hunting Kazakh elder who hosted us to lunch near Sagse.

grandfather of the current elder, having with beautiful tooling and ornament at least 100 years old and decorated in old Kazakh style. The current grandfather came in with his old Kazakh hat, and we had great conversation with him, getting lots of pictures. More of the same when we shifted next door to his house, and then went out to see the eagle, which was kept in a darkened stable stall with a hood over its head. They also had a new colt in the stable born only six hours earlier. Unfortunately, in the desire to please our photo-penchant crowd grandpa kept trying to put one of the youngsters on the colt's back; it was clearly terrified, and the mother was also expressing great horse-concern. The eagle also came into some rough handling as we were taking pictures. Because they acquired the bird in protected national territory without a permit they have to give the government 20 wing feathers each year to be used for fletching arrows in government archery tournaments.

Our lunch host's father said there are about 100

families in this valley. This area is so productive that it was able to secede politically from Bayan Ulgii sum, under the leadership of our host, a revolutionary movement in its time. Later he became the subject of a movie on Kazakh eagle-hunting and was featured in a book by a Swiss author and a fine photographer. The well-thumbed copy was a family treasure.

After the visit we drove to the sum center, Sagse, a small town south of Bayan Ulgii, to get directions to the third deer stone site Bayaraa had heard of, located somewhere south of here. Berekbol drove us into the center of a tiny market quadrangle where we were immediately swamped by a bunch of men offering information and mostly unhelpful advice – a typical situation when asking for what seems like simple information. Eventually Bayaraa tried calling his friends in UB for site info, but he found little help in that quarter. In the end we had enough information to get to the general location, over a very bad road, with barely enough time to get any work done. But we figured we could find the site by dark and have a day to work and still get back tomorrow. Our problem was both a shortage of time and tugriks, since we needed to catch the plane on Thursday afternoon (it being Tuesday now). We failed to solve the fund problem at the local bank, which would not accept U.S. money. But when I found my remaining 90,000T was more than enough for gas, we quickly fled town.

GPS 291 (8677'; N48°50.715'; E89°21.196'). A fix taken from the van at the first high pass in the range south of Sagse.

The directions we got in Sagse led us over 125km of scary roads with muddy traps, and past a big white lake. Soon were crossing the first high pass (GPS 291), nearly 9000 feet; then on to the snowy, muddy upper valley, which had many herders and huge cattle byres to house their large herds entirely inside, a requirement due to the severe weather these alpine areas can have. It looks like many of these people stay in this region all year, because snow melt water continues to be available right into summer (GPS 293: 8192'; N48°38.125'; E89°58.306'). To the south we found White Lake, still frozen solid and very 'white', and with the snow-covered Altai range rising to the south we drove into a broad valley where the lady proprietor of a gas station pointed out the location of some standing stones in the northeast corner of the valley. There were two gas stations at the river crossing in the center of the valley, but this one was the only one operating. The bridge here is one of the finest I've ever seen in Mongolia, constructed of steel and concrete with huge reinforced abutments armored against flood. The road across the mountain was also a major successful public work without which, most of time, you'd never get through this high country, even in summer.

Unlike our other excursions for deer stones, this time local knowledge and Bayaraa's accurate coordinates helped us find the site immediately. There could be no mistaking it: a huge site with several khirigsuurs and a huge long line of deer stones with perhaps as many as 15-20 standing, many teetering over, and more half-broken and partially buried. The sun was setting as we arrived and it was simply a gorgeous setting against the snow-covered mountains and overlooking the whole valley, one of the most beautiful locations I've seen, a mountain valley herder's paradise. There are many granite deer stones but also lots of made of greenstone, greywacke, or slate. Most have circles and deer carvings, and some have additional animals like rams and some deer with legs extended (thought to be later style). The granite stones are eroded, making it hard to see the carvings, but the green/blue slate-like rock shows every peck mark clearly, and unfortunately these stones have been heavily marked and vandalized, making it hard to read the original carvings. There are many small stones and stones of irregular shape, and many are jammed close together. The site looks like it has not been "reconstructed" as Ushkin Uver seems to have been; so maybe it is in its natural condition.

We'll spend the day tomorrow to see what can be done. There has only been one report on this site, years ago. I noticed no horse burial mounds, but there are scores of stone hearth rings, and some of the khiriguurs have doubled fence walls.

The moon was rising nearly full over the mountains to the east. This is a very dramatic site indeed, but I think one that will not easily reveal its age. There are several major differences between the granite and slaty deer stones. The most important is the time involved in carving. The granite stone requires huge efforts in pecking while the slate is much softer and every peck is easily seen as a white dot. Images can therefore be made almost instantaneously. This feature has resulted in the slate becoming covered with graffiti over the years. Some are so marked up that you hardly see the



The huge Tsagaan Chuulot deer stone site with its many broken monuments. (photo: Bayarsaikhan)

original carvings and can't make useful photographic images; therefore, we must rely on drawings more than photographs. The slate stones here are covered with Cyrillic names of Kazakhs, who with varying degrees of care and style, added their names to the stone pages of Altai (now Mongolian) history.



Tsagaan Chuulot deer stones made of greywacke, broken and damaged by modern graffiti. (photo: Bayarasaikhan)

Other differences are the readability of the images, the slate being easier, except when covered in graffiti, and the surprisingly greater durability of slate and greenstone versus granite, which erodes rapidly, especially the large-crystalled granite; whereas the slate grain is too small and its crystals too fine to allow water penetration and frost-spalling. Many of the granite stones have either lost their images to erosion or were never – or only minimally – carved.

30 May 2007 – Wednesday – Tsagaan Chuulot
Ts. Turbat of the Mongolian State University re-discovered the Tsagaan Chuulot (White Stones) Deer Stone site in the Chuluutiin Khundii Valley recently. The meaning of the name may come from the large number of khiriguurs present in this part of the valley that gleam white in the sun in contrast to the darker grassy. We only had time to survey the immediate area of the deer stone site; but Bayaraa walked around a bit and visited the khirig-

suurs south of the site near the river. He told me that Turbat had not mapped the site and requested us to do so if we had time. The following are some descriptive notes I took with a GPS to locate the deer stones in relation to the three nearby khirigsuurs, whose proximity suggests they are directly associated with the deer stones. The other khirigsuurs in the valley are many hundreds of meters away and have no obvious close association with them.

All following compass bearings are in magnetic degrees, not GPS degrees. Distances are based on paces and are only approximate. It was not possible given our limited time to measure everything accurately.

GPS 294 (7414 feet elevation; N48° 30.393'; E88° 57.084'). Northern-most standing stone (grey-wacke?). Top is broken off halfway down but it is present and fits to the base. No markings are present.

Khirigsuur 1 is looted and the grave cover slabs (greywacke?) are exposed in the depressed center of the khirigsuur (GPS 295: 7422', N48° 30.391', E88° 57.026'). The grave chamber aligns 070° and is 6x1.5m in size, perhaps consisting of two graves created end-to-end. River cobble mound construction; cobbles appear to

have been recently borrowed from the south side of the mound. A grey standing slab bearing 100° from the center of the mound is installed into the east side of the fence wall in a 2x3m square cobble pavement that is part of an expansion of the fence. This small upright has images of two ibex or sheep on its north-facing side. The mound fence is made of small river cobblestones set in a 2-meter wide band around the mound and is about 2-3 meters beyond the edge of the mound, making the 'plaza' area almost non-existent; no features or radial lines were noted within this space [notebook sketch].

The diameter of the fence is 36m; the mound diameter, 26m, and mound height is about 1.5m. There are about 19 small stone ring features around the north and west side of the khirigsuur, with ca. 9 rings around the southern side that are about 8m from the fence line, and about 10 rings about 18-20m from the fence around the west and north side of the fence. All were concentric with the mound and generally about 4m from each other, center-to-center.

Feature 2 (GPS 296: 7447' elev., N48° 30.396', E88° 57.025') is a 1.3m diameter cobble pavement 4m southeast of the mound fence and bearing 165° from the K1 mound center. We excavated **Feature 1**, a small pavement between K1 and the deer stones, thinking it might be a horse head burial, 153°/28m from K1 mound center and is located at GPS 7457', N48° 30.379'; E88 57.044°. From F1, K2 mound center bears 212°, K3 mound center bears 210°, and the northwest deer stone



Looted Khirigsuur 1 at Tsagaan Chuulot with external feature in foreground which produced no horse remains. (photo: Fitzhugh)

cluster bears 065°. A small piece of bone with a shoulder (?) joint facet was collected from this feature (F1).

Khirigsuur 2: This khirigsuur's fence is 56m from the K1 fence. Its mound is about 1m high and is undisturbed, and has a double cobble row fence line and four radial cobble stone lines from mound to fence oriented 300, 024, 105, and 210 degrees. It also has many satellite rings and a large internal plaza area (15m from fence to mound edge) [field sketch] with no indication on the surface of a rubble pavement. A 1m diameter cobble pavement lies in the plaza next to the mound edge north of the western radial line, and a stone ring lies in the comparable opposite position near the mound edge north of the eastern radial. From the center of the mound the southernmost deer stone cluster bears 115°. The K2 mound is 20m in diameter and the fence is about 50m diameter. Nine stone rings lie to the south side of the mound about 9m beyond the fence beginning about 170° from mound center, while to the west and north is arc there are ca. 17 stone rings lies between 15-20m from the fence. Most rings are about 1m diameter, but there is one ring aligned with the 300 radial that is 3m in diameter. Rings are generally about 4-6m apart [sketch map].

GPS 297 (7427 ft elev.; 48° 30.298'; E88° 57.047') is a Turkic grave complex with 25-30 grave settings, all without baba figure statues.

Khirigsuur 3: (GPS 298: 7447 ft elev., N48° 30.347', E88° 57.069'; see field sketch) is the third khirigsuur associated with the deer stone complex. The northernmost deer stone bears 005° from K3 mound center. The K3 mound has been constructed with rounded river cobbles and is possibly not looted. The fence is made of a combined cobble and slab rubble, and there are east and west pavement radials bearing 300° and 120°. No north-south radials were noted. The plaza area is 11m wide from fence to mound and the mound is 15m diameter and fence diameter is 25m. Feature 3, a 4x2m rectangular cobble pavement with a 3m diameter circular feature at its north end, is 120°/24m from mound center. This combined rectangular/circular feature looks like it might be a burial. On the western side of the fence are a line of five cobble stone open-centered features [sketch] whose northernmost (#1) has a circular and a square feature bearing 340° from mound center, with the circular feature located outside (away from the mound) the square feature; #2 is a stone ring bearing 310° from mound center; #3 is a square open feature bearing 300° from mound center; #4 is a square open feature bearing 290°/12m from mound center; and #5 is a square open feature bearing 280°/15 meters from mound center.



Tsagaan Chuulot deer stone with deer images nearly obliterated by modern graffiti. (photo: Fitzhugh)

GPS 299 (7444 ft elev; N48° 30.335'; E88° 57.017') is the southernmost deer stone group.

Circular stone rings associated with the northern deer stone groups appear oriented to specific deer stones, some of which are not standing or are buried. The rings are found

around the entire DS complex but are fewer on the north side and most numerous to the East and Southeast of the complex as a whole (about 25-30 rings). There are many fallen or buried deer stones in this northern group. The other group of rings is associated with DS Group 3, located between 15-26 meters along the datum line, all located east of the deer stones.

We spent the day working at the Tsagaan Chuulot deer stone site in beautiful weather, making a detailed deer stone site map and getting basic info on the three khirigsuurs associated directly with them. A Turkic burial ground lay a few hundred meters to the southeast and you can see 10-15 other khirigsuurs in the distance higher up the valley. About 8-10 visitors, some on horseback, some in jeeps (the wealthier herders), were mostly just curious, and some probably had written their names on the stones, since most names must be local and there must be more than 100 on the stones. One of the three khirigsuurs had been looted, the closest and largest; but the others were intact and represented different types, as shown in the foregoing notes. A number of the deer on the stones were different from central Mongolian types, mostly having very long bodies and legs shown in running position, not curled under them, and have smaller eyes. No belts or tools are seen on any of the stones and no sun/mirror discs or small moon figures, only the grooved ring, also only at the upper position of the stone. However, the same extended 'beaks' and antler scrolls along the back and the hump at the withers is present. However, there are several naturalistic deer seen standing without iconic form and with antlers going straight up, branching like a tree. One could make an evolutionary progression from naturalistic to iconic deer, and indeed some of the iconic deer are shown standing on straight legs. The site is very interesting but also very problematic in that we could not find any way to date the stones; and in fact you may need to date individual stones since the site has different periods or chronological range, at least given the different styles, images, stone materials, etc. We excavated one of only three pavements present that resembled horse head burials of central Mongolia, and that one (F1) seemed to be associated with the deer stones, while the other two were more closely associated with khirigsuurs 1 and 3. The long 8 x 2m pavement at K3 could be a burial, but in any case is not necessarily associated directly with the deer stones. F1 turned out to have a small amount of charcoal and calcined bone, and nothing more than 10cm below the surface (and no horse head!). We might get a C14 date from the charcoal. Most of the granite stones from the site are too spalled to tell if they had markings, and only in 1-2 cases could ring grooves be seen. Many of the greywacke stones have angled tops and wider tops than bottoms, giving them a blade-like look. There are many stones around the deer stone bases, many of them being broken parts of deer stones. I did not see any signs of obvious hammer stones on the surface. I made a sketch map of the 2 southernmost deer stone clusters. In all there are 6 and if you count a small cluster at the north-west end of the site, there are 7. Maybe these groups have some social or other meaning, and only in Groups 3-4-5 are granite stones standing; but in Group 6 many granite stones are down, making one think that the dark non-granite stones are the survivors and perhaps chronologically the latest.

The day went very quickly, but perhaps not for the small bird whose 3-egg nest was at the base of one of the northern stones and who could not stay on her nest for all the activity around her. The squirrels were also at a loss, unable to feed, and the moment we packed up they were out munching grass. We also had the guttural call of the cranes to keep us company. About 5 o'clock Onlo made a memorable soup of noodles and a few veggies that was so thick I could not decide if it was a stew or a soup, but it was hot and starchy and much appreciated. We left about 6PM, having discovered that the chassis of our van had cracked behind the left rear tire; it had broken and been welded before and now was cracked anew, not surprising considering the way Berekbol drives the machine, that is, definitely to its limits, and well beyond. We gassed at the local hotspot 'garage' on the side of the

hill next to the bridge. It was manned by a cheerful Kazakh lady who must have seen and heard lots from her perch at this strategic location over the years. It's amazing that gas is available at this outpost; but I learned from the lady keeping the gate at the entry to the mountain area that this route is the access to the Chinese border and several other important Mongol settlement regions to the south.

GPS 301 (7840'; N48°33.636, E88°51.851') Driving out of the valley, after climbing the hill south of the river, we passed a huge frost pingo which we could only observe from the van and could not stop to investigate due because we were short of time. There was a huge crack in the top that you could see right through from side to side. It looked like it might be 6m tall, a huge comical structure perhaps 20m across its base, located in mushy permafrost in a lumpy (i.e. a permafrost surface indicator) field below a hillside with a late-lasting snow mass, and at the upper edge of a stream with a very low gradient, ie. lots of water is available for 'pingo-building'.

The drive to Bayan Ulgii was about six hours and took place at a breakneck pace, half of it in the dark, which is not necessarily bad since the headlights show us the road conditions better than during daylight. Berekbol did a masterful job, but every so often he'd make a mistake that pitched us into the roof, a result of his beyond-the-limit driving style, swerving back and forth across the road to find the best advantage around each new constellation of potholes, rocks, and ditches. The other problem was the exhaust fumes that seeped in from the engine box next to where I was sitting next to the driver. There were also the ever-present mechanical problems, such as the over-heating engine. He had to wear a headlamp, which he switched on every few minutes to check the temperature gauge. If too hot, he would swerve around to point the van downhill (it could roll back downhill if all else failed), putting more water in, stopping at streams etc. His warning lights were going off more or less all the time. And I heaved a great sigh of relief when we made it over the high pass and started the long descent – in neutral, of course, to save gas – relying on the breaks, which by the time we reached the river plain were squealing and shrieking, pads gone, bare steel-on-steel. The final flourish was our arrival in Bayan Ulgii with a screeching stop in front of the hotel that scattered a bunch of teenagers drinking on the sidewalk who thought we were going to careen into them. To call this vehicle the "Millennium Falcon" and Berekbol, "Chubakka," could not be more appropriate.

It took a while to get rolling this morning, but by 8:00 I got the hotel boss lady to let me into the shower room where I managed to scald most of the dirt off me. The water heater unit only had one temp – boiling. We packed and went for a short tour of the museum, which was started by the father of our driver's wife, Aishagul, in 1942. It's now a quite respectable natural and cultural history museum. Among the interesting traditional items was an amazing Tuvan shaman's ritual wand with a human face, lots of cloth tassels, and a bottom end with the skeletal chevron motif, similar except for the figurine look to the shaman's drum beater. They had a very nice sales shop full of Kazakh-style rugs, wall hangings, personal clothing and house-wares that include old and signed materials that people bring to the shop for sale. I bought a small table cloth that is about 50 years old and mended. The museum had a plaque in the lobby from a Korean museum thanking them for loaning them the "Legacy of the Steppes" exhibit, written in English.

After lunch we got our bags and went to the airport where we encountered the usual mêlée as everyone tried to push their way through the check-in process. Our excess baggage came to a cool \$195. We had tickets for 5 but actually were a group of 6 counting the Bronze Age skeleton person who had joined our group. We met a team with the Asian Development Bank, including road engineers, management specialists, and others who were returning from a feasibility/planning trip to Bayan

Ulgii. They have been planning a paved road from Bayan Ulgii to China through the area we just traveled and are concerned about the locations of deer stones and burial sites, which they wanted to try and avoid in the construction plans.

1-5 June (Ulaanbaatar – Preparations for Hovsgol)

We returned to Ulaanbaatar the evening before our research conference on Mongolian Bronze Age archaeology was to begin. We held the meetings in the new university building where the American Center for Mongolian Studies has its offices and were ably assisted by Bryan White and Enkhbaatar. The papers by Endenebnatar, Turbat, Amartuvshin, and Bayaraa were especially good, and stimulated lively discussions. We also held meetings with Dr. Ochir at the National Museum of Mongolian History, during which we were reminded that we are in the last year of our official work agreement and will need to renew during the coming year. We also heard that our project received high marks from the archaeology committee for field work and reports, and that several other groups and researchers had not had their permits renewed for lack of results. I met briefly with Professor Bira and had an excellent discussion about our Genghis Khan exhibit project. He gave me copies of his two articles on Tengherism which we may use in modified form in the G.K. catalog. I also had a brief meeting with Ariunaa at the Mongolian Council on the Arts. I was surprised and delighted to find Elbert Sampson in town engaged in negotiations with the Ministry of Culture over the GK loans and object lists. He was staying at the Bayangol Hotel which was hosting the drivers and cars that were having a lay-over during their transcontinental rally from Beijing to Paris – quite an operation, spiffy machines fitted out with fancy people and extra gas tanks. Elbert and I had a number of meals and a session with Ochir and Bumaa about the G.K exhibit. We seem to be making progress with the artifact list at the museum and at the Institute of Archaeology and History Museum. The process is overseen by Oyumbilig, the director of foreign exhibitions at the Ministry of Culture who has been Elbert's principle connection here and is in charge of all museum loans. A major problem developed recently with the Yuan Dynasty material which may not become available until the stuff comes back from an exhibition in Italy in July – a month after the Seattle venue is supposed to open. [All this changed later in the summer when the Seattle venue was postponed.]

It turns out I need an extension to my visa because I am going to be more than 30 days in Mongolia, and this will cost me \$100 because it was supposed to be done within one week of my arrival in UB – just another way to milk money from visitors. Meanwhile, before and during our period in town the rest of the team had been assembling. Matthew Rasmusen arrived from California the day before we returned to UB and had already walked far and wide about the city; he's well-traveled and adjusted easily to Mongolia, but he has some school work to finish for Santa Cruz because they let him go before the end of the semester if he finished his papers, so he's been spending lots of time in the internet shops. Matt is a son of a family friend of Slade Backer's in Berkeley. Matthew Sagi has also arrived for our Hovsgol project, and is a student of Francis Allard's of Indiana University in Pennsylvania. He's interested in geology and Buddhism – an unusual combination. Another new arrival, Bill Stewart, I met at the 2006 October Mongolian Festival at the Smithsonian. He had been an architect but bailed out to start a brewery/restaurant in Arlington, Virginia. He sold that last year and invested in Apple Computers, moved to be with his girlfriend in Australia and is planning to start a brewery there, "when the money runs out". We'll put his architect's training to work mapping sites.

While we were in the Altai, Adiya had organized a U.B. performance of the Brigham Young University Mormon Choir in Hawaii, with great success. He and his assistant, Uggii, managed our arrivals

and trip plans – mostly hotel deals, border permits, etc. He is also the local trustee of my Ambassador's Grant from D.O.S. and last winter ran a language class at the museum for our students and museum colleagues who had made great progress, especially Bayaraa and Tugsu. Tuesday evening Christie, Rae, and her assistant Christiane, who is a technical expert working with the German company that sold the scanning equipment to the SI MCI lab, arrived from Germany, and we were able to leave about 11:30 in the morning of the 6th, in four vans including one hired by Wayne Paulsen and Marilyn Walker.

6 June 2007 (Ulaanbaatar to Ulzyt River Camp)

Our departure from UB in a caravan of 4 vans was a sight to see; also frightful was the cost of fueling those vans at the first service station. I paid for only two and Marilyn and Rae paid for theirs. I'm guessing that my bill was about \$250. Part of the Millennium highway was under repair and the western leg of our trip took longer, but eventually we reached the area of the Khar Buk Balgas archaeological site and the regular dirt road. The passage through the steppe just before Ulzyt was gorgeous in the lowering sun and was enhanced by the tall grass, un-grazed grasslands. A group of four gazelles crossed our path at one place, beautiful fleet, graceful runners. Supper was beef and potato soup fortified by Ramen Noodles. Once again, setting up camp resulted in some consternation because Elaine Ling had not brought a tent, but Rae offered room in her tent. It was quite a warm night.



Ulzyt deer stone being inspected by Bayarsaikhan. (photo: Fitzhugh)

7 June 2007 Ulzyt to Muren – Ulzyt Deer Stone site

This is the village near our campsite where there are three erected deer stones that Volkov worked on. As last year, we camped again along the river opposite a large farm. We got in just before dark, and while setting up camp discovered Wayne's and Marilyn's luggage was missing. Later they found their bags were still sitting in the lobby of the hotel. At least they are not lost and will be brought north to Rinchinlumbe.



Elaine Ling and Bill Fitzhugh at Turkic monument site south of the Selinge River, Hovsgol Aimag. (photo: Elaine Ling)

8 June 2007 (Muren)

The Muren ger camp hotel is better set up this year and even has showers with hot water and working toilets. The gers were clean and

not full of beetles, and beds were comfortable. We had a dinner – pretty heavy on the noodles – in the hall on the top floor and filled a huge long table. Wayne Paulsen regaled me his idea about the magical approach to deer stone carving. The basic idea is ‘kinetic art’ involving the stone cutter’s approach to the rock. He thinks a deer stone would be carved in the same way as a ‘mani stone’ in Tibet or India. I think deer stones were more consciously planned and done over a shorter period of time. While I am sure their production involved ritualized activities, I think the process was not a ‘ritually additive’ process taking place over extended periods of time.

We spent the morning on chores in Muren, beginning with a visit to Ms. Altansetseg, director of the Muren museum. She received us with the same scowl as reported by Paula last year but soon warmed up. We invited her to visit our digs when we move back down to Erkhel, and we gave her copies of our reports, which she seemed interested in. She then proceeded to tell us about 22 artifacts that had turned up missing in an inventory – including several gold Buddha statues and some ethnographic collections. Police are investigating, including the former staff. She made a point of saying that pieces from her collection that had been borrowed were not returned by officials in Ulaanbaatar, and that five shaman costumes loaned to an “NGO” had not been returned, except for a drum. Her dealings with the central authorities have not been very satisfactory and make her reluctant, for instance, to loan materials to the Mongolian Museum (NMNH) new show on birch bark collections. She has the only key to the objects and will be moving the remaining collections from the decrepit and condemned



The project’s ‘senior’ archaeologists, some more ‘senior’ than others: Fitzhugh, Sanjmiatav, and Bayarsaikhan. (photo: Leece)

downtown museum this June so building renovations can begin. Rae had arranged with her to scan the ‘missing’ 15th deer stone from the Ushkin Uver site which had not been scanned in 2006 because it had been stolen from the site; now that we’d learned its location it would be good to have scans of all 15 stones.

Christie emailed Abby about our Quebec permit and report corrections and we did a major shopping spree. The market was fairly empty. I got 300 meters of nylon line as a present for the Tsaatan, and three shovels. Lunch was at the restaurant that used to have the reclining nude chopstick holders, but this year they were gone. Then we were off, but not before some conversations with Marilyn about Ayush over their joint field work, where there have been some misunderstandings due to communication problems. We finally got moving at 3PM and spent an hour at Erkhel so the students could see the site and Elaine Ling could photograph the stones and make a group photo. The trip was a bit slow due to recent rains. We took several rest breaks and got to a nice grassy campsite on the river, which still had shelves of winter ice, just south of Toms Brigade, as it began to spit rain. Amraa made a quick noodle stew and we turned in. Erecting Elaine’s new tent was a trial that we passed only by using huge amounts of the new nylon line. It’s one of those \$38 Chinese specials where all

the tabs and loops rip out when you set it up for the first time, or have the slightest breeze.

9 June 2007 (Belktes River Camp)

Cuckoos were calling in the morning. We started traveling about 9:00AM, driving up the mostly dry river bed to Toms Brigade, noting huge erosion scars on the banks from the August 2006 storm that trapped Adiya near this spot for five days. We passed Toms Davaa and Olin Davaa, where someone has put up a picture of one G.K.'s sons. The big ovoo covered with a tipi-like structure of poles was more gruesome than ever, more like a 'cave' of horrors inside the pole-constructed tipi structure over the ovoo, with its donations of skulls, old crutches, money, food remains... Someone put up a green bird at the top of the tipi poles. Next to it is a structure covered with prayer flags making it look like a shaman standing with arms outstretched. Ulaan Uul, quiet except for our crowd staging a raucous volleyball variant of monkey-in-the-middle, looked as if lots of money had gone into the town during the last year; many new buildings and refurbished older ones.

We had a nice warm weather lunch of hot ramen noodle soup at the big river north of Ulaan Uul and skipped stones across the river while the boys helped a Chinese (?) journalist get his Toyota out of the mud. Mat Sagi got himself plastered in the process. The journalist has a daughter in school in Arlington, Virginia. He was working for a Mongol newspaper, but Bayaraa says he had a Chinese accent. We couldn't get him to tell us what kind of story he was doing, and later after we had led him through some tricky places on the road, he sped off ahead and we later found him pulled up at a ger camp on the Khug River waiting for a thunder storm to pass. We got caught in it too and by the time we got further north in the Darkhad we were in for difficult times because of the muddy roads. At one place all three vans almost got stuck, and in another we had to detour along the lakeshore to by-pass swollen, mud-banked streams. The drivers did an amazing job holding it together, and we cruised through Tsagaanuur about 6PM and got to the ferry on the Shishged about 7:30. When the ferryman showed up he said the bank on the other side was too slick for the vans to get up the ramp from the ferry, so we had to camp overnight and wait for it to dry up. Another rain-squall hit us as we were setting camp. Locals say it's been very cold and wet here in recent weeks. I hope everything changes soon, as we don't have much time here.

10 June 2007 (Shishged River)

It's been cool and spitting rain all morning. After breakfast I inspected a small hillock of silt (GPS 302: 1533m/5099 feet elev. N51°24.467'/ E99°17.267') a couple hundred meters south of our camp, where squirrels have turned up the soil. On top was a big piece of iron from some machine and about 50 m east of that I found a stone maul lying on the surface next to a squirrel hole. Since there was yellow grass underneath, I think it must have been brought up by the squirrel recently, although this maul was almost squirrel-size itself! It had been pecked into



A pestle from a squirrel hole south of the Shishged River ferry landing. (photo: Fitzhugh)

shape and had use wear and impact spalls on the bottom, working end, and the top had a protruding cap giving it the shape of a penis. I thought this was quite unusual, but Bayaraa says this type of implement is common at Neolithic sites. Looking around further we found other ground stone pieces in

the squirrel holes on the north side of the hill and on the top. Some of the animal skulls eroding from the soil look old, so perhaps this might be a good site to excavate. It sits on a peninsula that once projected into the river, so maybe this is a reason for its location. Bayaraa says the grave features in the side valley where I found the modern women's grave last year are Turkic period.



Surface-collected microblades and cores from the Khogorgo gol site.
(photo: Fitzhugh)

Later in the morning we managed to get the vans across the river, but Hatbaatar's van – the first to try, slid back sideways down the muddy ramp slope almost into the river.

We managed to pull it out with 20

people on a tow line. Tsera got up ok with the aid of a trench we dug through the mud to the in situ dry soil below. Tsog had to make a special trip to Renchin today to find Rae's computer and tripod, which had got left in Marilyn's van by mistake – a perilous trip with many mud encounters.

GPS 303 Khogorgo River Neolithic flint site, Locus 1 (5177'; N51°24.733', E99°18.464'); Locus 2 (GPS 304: 5197', N51°24.722', E99°18.450'). Soon after setting up camp beneath the bluff on the east side of the Khogorgo River, east of the ferry, we found the ground littered with flakes of black chert and while setting up his tent Mat Sagi found a nice microblade core. So we realized we had a big Neolithic site in our hands and spent the afternoon mapping it and starting an excavation at a stone pavement near the middle of the site area just below the terrace front. The area is full of squirrel holes and almost every one had brought up flakes of the black chert that is so prevalent in this area. Surface collecting resulted in few artifacts other than microblade cores and a single tiny bifacial leaf-shaped point similar to the flat based ones from Soya. We still have yet to see burins (turns out there were none). The size of the microblades is so small that it's hard to imagine them being inset in bone points. This may be a chronological



Check-stamped ceramic shard from Khogorgo Gol burial feature.
(photo: Fitzhugh)



Petroglyphs at the Avtiin Hill East site showing standing elk/maral with 'realistic' antlers. (photo: Fitzhugh)

En route to the Avtiin deer stone site we drove up the hill and visited the big rock art panel we found last year. On the art panel the deer is only finished to the rear haunches; its rump and legs are not shown, perhaps because a goat was drawn there first. Also, the deer looks less weathered than the other animals on the panel (deer, goats, or ibex, stick figures). There is no lichen on the rock except for the lower portion. The big deer seems almost to be a bird, missing its deer hind-quarters and appearing to have a bird's rear end instead. It looks more recent and un-weathered than the other art – all animals – but this could be from recent “refreshing.” None of the other animals cross or crowd the deer, making it seem like a primary element in the rock panel. Scanning the big rock panel would be difficult and not very informative, so we decided to drop this in favor of scanning the Avtiin deer stones.

After visiting the two rock art sites we stopped at the lone deer stone at the crest of Avtiin Pass and found it more elaborate than last year, decorated with several large dead trees 10-15 ft high propped

factor, possibly later than Soya. We had a big soccer game in the evening with our partially deflated ball. We have some great players, but I sat it out, other than serving briefly as substitute goalie for Amraa.

11 June 2007 Khogorgo River

This morning we learned that Tsog had arrived at the south landing of the ferry and our drivers had flashed lights verifying it was him. He came across without problems with Rae's equipment and tales of bad mud between Tsaganuur and Rinchin. Marilyn and Wayne were also stuck and had to leave their driver to protect the gear while they hitched a ride to Rinchin. Tsog helped get their car out when he came back. So we are at full strength finally in terms of equipment and people. Elaine Ling's vehicle, drivers, and translator also arrived ready to take her south tomorrow, a day earlier than planned due to the mud and her plane departure from Muren two days later. We dug at the Neolithic site at our camp in the morning and went off to check out the rock art sites after lunch.



Deer Stone 1 at the Avtiin site. (photo: Fitzhugh)

up and festooned with prayer ribbons and horse, sheep and other skulls. The transformation of a deer stone into an ovoos was strange and garish and quite unpleasant to see. I wondered if this had been done to accommodate tourists. Another deer stone we saw between here and the Hort Azuur deer stone site last summer had also been ‘decorated’. The Avtiin Pass deer stone had a circle, belt, and a well-formed dagger and some other difficult-to-decipher implements. It’s badly coated with bird excrement. We noticed several clusters of rocks around the stone, confirming that it is in primary position and has not been moved as we suspected last year, and suggesting we might be able to get some horse head dating material from this site.

Arriving at the Avtiin Deer Stone site (GPS 309: 1700m, N51°28.010’, E99°21.906’) we found the four deer stones as we had left them last summer, including the large stone we excavated last year from a looter spoil pit and erected (DS1). **Deer Stone #1** is square topped with row of (necklace) pits; circles on opposite sides at the top of the stone; a disc and double slash marks (//) on the “face” side; a belt with zig-sag decoration; a pick on one side with a circle, other side is hard to read. We erected this wrong last year, making the “face” side face south when it should have been oriented to the east. In looking closely at the pecking on the Avtiin big deer stone #1 it seemed like at least the thin and delicate parts must have been carved with a metal punch or stylus, so fine and thin were the lines. It’s difficult to see how a rock tool could be used for this part of the work. **Deer Stone #2:** is round-topped and thin with row of pits and // and an “O” on one side; it is broken 60cm from the top. **Deer Stone #3** is a very small deer stone of dark granite with many symbols, including a // face, side rings, a chevron with a vertical bar thru it, a rectangular quiver and several other implements shown. It is broken in half and was found in the looter pit last year. **Deer Stone #4** is part of a similar deer stone without any visible markings.



Christie Leece and Sanjmiatav. (photo: Fitzhugh)

Rae and Christiane spent several hours cleaning up the big granite stone (DS1) for scanning tomorrow and documenting the set of four. The rest of the team spent four hours excavating two new features (4 and 5) and documenting deer stone #1. The features both turned out to be hearths with calcined bone fragments, but F5 produced some charcoal and a bit of unburned bone that look promising for dates. There was no sign of horse heads. One of the herders who came to visit us while we were working was the principal looter of more than a dozen khirigsuurs in the area who ended up, we were told by our friend of last year, the local marshal, being busted by the police and doing jail time. He found some interesting materials (unspecified) but gave or sold it all away. Now he’s reformed, or so he says. It was a beautiful all day, with a light

southern wind for the first time during our arrival in the Darkhad. And it was glorious to be working in the sun in shirt sleeves in the midst of that vast meadow, with the green forest bands sweeping around the margins of the hills and snow-streaked mountains (Russia) in the distance. During the afternoon Adiya, Ayush, and Tsog went from farm to farm trying to buy a sheep but were turned

down by everyone, for various reasons, like moving to summer camp soon, etc, until they finally tried the marshal, and he agreed. They finally rejoined us about 9PM, and we rode back to camp with a very nervous woolly passenger in the rear of the van. Dinner was mashed potatoes, noodles, beef (canned) and cucumber and bean salad which we scarfed down quickly, and then the sheep was dispatched and butchered by Enkhbold, and the organs, blood and intestines were processed by Amra for a feast of sausage and organ meat tomorrow. The evening was warm and people stayed up late, transferring camera files to Rae's computer after she tested out her scanning equipment for tomorrow. Rae had some initial concern about her Honda generator when it started smoking; it turned out that she and Hatbataar had overfilled the oil and it had seeped into the pistons, seizing up the motor so you couldn't even pull the cord. Bill Stewart psyched it out, drained some oil off, and it started right up. Christiane tested the gear by scanning Adiya – with an amusing result. Ayush started interviewing local people around our camp area. One family had the skull of a wolf they had been tamed to protect their sheep and other animals – kind of a fox-in-the-hen-house arrangement. Ayush will return to U.B. with us rather than go to the Tsaatan.

12 June 2007 Khogorgo Camp

Beautiful clear morning, but the bellowing of the cows woke us up when they came wandering into camp and found the slaughtered lamb – they get agitated at the smell of blood. With Elaine's imminent departure and complications with the police it took a couple hours to get organized. The police problem began when Tsog passed the border patrol cop in Tsagaanuur and mentioned where we were camped north of the Shishged, which requires a border permit. In fact we have one, but it is with Marilyn because she is going into the back country, not with us, and we did not know we needed to have a copy with us also. As a result he started throwing the book at us for being illegal, with threats of huge fines. The upshot was that we had to send Adiya and Ayush to Tsagaanuur today to work out a solution, which is still pending as it requires Marilyn's arrival from Rinchin with our travel documents.



Bill Fitzhugh writing notes at Avtiin Deer Stone Site north of Shishged River. (photo: Elaine Ling)

We got back to the Avtiin site about 10:30, while Elaine went on with her driver so see to the tiger deer stone site at Hort Azuur. She wanted to photograph the big stone there before she had to leave for Muren. The digging at Avtiin was not too exciting, but we did find some good charcoal, a small piece of un-burned bone, and lots of granite spalls and flakes, and blocks of granite blanks or parts of deer stones. Both features had burned bone and had been feasting locations. After returning to camp for lunch Mat Rasmusen disappeared, walking, “doing his own work” – no problem, except I need to know in advance. He's been ranging far and wide in the evening, one time stumbling over a camel at rest and was able to approach and touch it. He's preparing an illustrated book of “field notes.” After lunch we returned to Avtiin and soon Elaine Ling arrived, happy with her visit to Hort Azuur to see the ‘tiger stone’. We had prepared a fake horse head ‘find’ at our site for her arrival, as she had

been desperate to photograph one of our horse discoveries; but since our excavations had not panned out we placed a modern head into the back dirt, saying we had dug up while she was away. We did not convince her. “You wouldn’t have NOT saved it in the ground for me,” she laughed.

Bayaraa, Sasha, and I went to look at a looted khirigsuur across the valley near a herder’s place called Tsagaan Oos (White Water) where we found a looted khirigsuur (GPS 310: 1744m; N51°29.272’; E99°22.626’) with several outlier stone features, no clear fence, a central mound 19m in diameter,



Matt Rasmuson and Matt Sagi levitating “light-as-a-feather” Uгна.

and a small greenstone deer stone to the north of the mound, 10m/015° from the mound center. The khirigsuur has a rectangular stone crypt about 1m below ground, 8-10 out-lying satellite mounds, and pavements on southwest side of the khirigsuur. Some of these may be plaza pavement rocks. The deer stone has a ring at the top, is 75cm tall top-to-bottom, and is lying in the turf. Several more khirigsuurs are found on hillside north of this site.

We returned to camp about eight o’clock for a curry rice meal for the Americans and a nice-lamb stew with the liver for the Mongolians, who don’t like curry – and the Americans, except me, don’t like liver. Later in the evening our northern Wildlife Marshall friend showed up on his white horse in a fine humor from Tsagaanuur. We had a great conversation with him, answering his many strange questions and things he’s heard about the U.S. – like still having live dinosaurs and octopuses with faces. He’s a great character and wants us to return so he can have more conversations next year. He rode off at 11 under the dim moonlight for home, 15 kilometers beyond the Avtiin site.

13 June 2007

We arrived at Hort Azuur about 10AM. There were squalls and thunderstorms until 3, after which it was clear and warm. **Deer Stone 1** (not scanned) of fine-grained black speckled white granite, lies 120cm above ground, in situ. At the top of the south side is a two-pendant circle groove; no belt is obvious, and there are a few obscure marks near the base. Nothing on the other sides. **Deer Stone 2** (scanned) lies exposed, has an angled top, and is 122cm long. There is a grooved ring ‘O’ at the top of the exposed broad side, a // ‘face’ motif on the thin side; a necklace of pits rings the top of the stone, and a sword with a hilt hangs from a belt that is mid-way down the stone. **Deer Stone 3** (scanned) is the ‘tiger’ stone and is 159cm long, has a thin top, and a broad base. There’s a tiger and deer on the broad side. **Deer Stone 4** (not scanned) has a belt all around and a grooved ring on one side. **Deer Stone 5** (not scanned) was broken in half (see 2006 description).

Deer Stone 6 (not scanned) is 126cm long, has an exposed upper side, and is badly eroded because it is made of large-grain crystalline granite. There’s a belt and a possible ring at the top which we found on the side of the stone turned down into the earth, offering better preservation.

We inspected other rocks we thought might be possible deer stones, but all were un-worked. We

finished work about 8PM after excavating what turned out to be four circular features adjacent to each other along the east side of the Deer Stones 2, 3, and 4. Before excavation, the features appeared to be a single 8X3m cobble pavement aligned north and south east of the deer stone alignment, but after clearing the turf we could recognize the four separate rings and had high hopes for house heads, given their eastern location and boulder settings. We were rewarded by finding chert flakes and eventually a biface preform and a few microblades from the north and south features, L4, F3 and F1; later we found a dense concentration of flakes (chalcedony and brown/black chert) in F2's western wall, but few diagnostic tools. All this was disconcerting as we had never before found so much stone flaking in a late Bronze site. The flakes came from the lower brown soil (loess almost, it was so fine) and the upper tan sand and gravel. Some charcoal came from the upper brown



Hort Azuur excavations at Deer Stone 2, pavement features 1, 2, and 3, looking north. (photo: Fitzhugh)

soil, and at first we discounted its association with the stone mounds, thinking it might be a later intrusion from squirrel holes; but the later were very few. Some flakes and tools were found inside the rings, but most were outside, suggesting they pre-date the rings as a Neolithic occupation. Charcoal recovered occasionally from the brown/tan interface may substantiate this. In the meantime excavation of the rings was singularly unproductive, and we found nothing in them except in one case, outside F5, a small amount of burned bone; no horse head burials or any sign of subsurface digging or pits. So, once again, the Darkhad deer stone's contexts

are different from south of the region, and we need some believable dates to see why. These features were not like the feasting hearths as they had full rock pavements and no calcined bone inside, as in the Avtiin case; so some sort of ritual mounds, but without horse burials or tools that survived. While we dug, Rae and Chrstiane scanned DS3 and 4, having an interruption when a really bad looking thunderstorm threatened and gusts of wind almost blew down the tent we had erected over the stones to shield them from sunlight. But all but scattered rain missed us, sweeping north and south of us and over the Horidal Saridag Range. Then it cleared and we had a warm evening. Our ride out with Hatbaatar was to the same now-for-3-years familiar tapes he plays at incessantly and at loud levels. Hard to see how there is any music left on them. Adiya and Ayush went to Tsagaanuur for more discussions with the border police and seem to have convinced them of our good intentions and that the permit papers would arrive in a week or so with Marilyn and Wayne. Ayush also had a chance to look at the collection from the Tsagaanuur Museum that have been locked up in the governor's house since a shaman's costume was stolen from the museum several years ago. Everything is in a jumbled mess, but at least it is cold most of the year and even cool in the summer. He was able to secure tentative approval for using some of their birch bark collections for a show late in the summer at the National Museum. Among the items is a birch bark tent covering. We had a great meal of mutton, spaghetti and boiled potatoes. Called Abby in DC – everything's ok there.

14 June 2007

I forgot to mention the strangest thing about yesterday's work. We had barely begun to clean the cobble feature of grass and turf when Mat Sagi broke his shovel handle prying up turf between the rocks. It wasn't a big problem as the drivers fashioned a new handle. Then, after 15-20 years of trusty service, I broke the blade of my trowel, also prying turf from the rocks. It wasn't more than ten minutes more before I broke the blade of another trowel – both Marshalltowns – after never having broken a trowel in 30 years. I've lost them sometimes but never broken them. Then Bill Stewart

broke the blade on his trowel – all of this happening to the group of us working at feature 6, with all this bad stuff happening, we were certain this feature was resisting investigation and would yield some spectacular discovery. But we found not a thing of real interest, nor at any other feature. These were strange doings. My faith in Marshalltowns is slipping and I may shift to a new model that Mat has, with a contoured rubber handle and a thicker blade. Today was to be our last at this camp and we had a whole day to finish the cobble feature we had exposed our first day here. The weather was like yesterday – beautiful in the AM and thunderstorms in the morning and evening. It turned out we needed more time after the excavation proved much more productive than we anticipated, with many flint tools (Neolithic) and a variety of ceramics, some thick Bronze Age stuff and also thin Neolithic material. These artifacts we scattered throughout the fill above and below the paved circle, which turned out to have large cobbles throughout and a few large slabs in the center. After clearing and photographing we removed the rocks from the center and found Neolithic artifacts and large



Khogorgo-3 burial mound with center rocks cleared, revealing upper burial rocks. (photo: Fitzhugh)



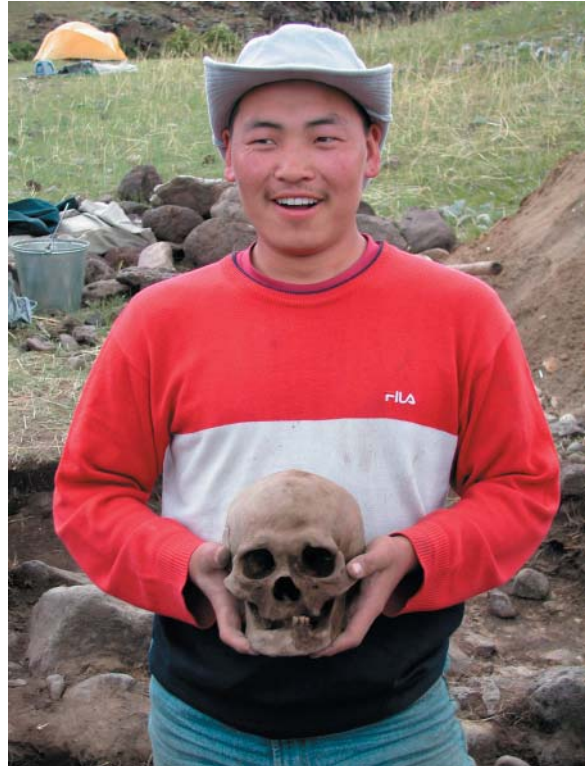
Khogorgo-3 burial in sub-mound pit, flexed on left side and facing south. (photo: Fitzhugh)

amount of flakes in the brown silty soil below. Eventually we worked down to rocks descending into a central pit about 3m in diameter, into a tan silty sterile soil. At this point – 8:00PM – we got hit by another storm and retreated to a supper of horshur and local yogurt. It was pouring hailstones! The storm cleared just enough at sunset and produced an amazing scene that seemed like the sky was on fire. Everyone scrambled to the hill but I was working on notes in the van and missed most of it. We were visited by the constable border police in the evening and he seems more

accommodating now and will accept the permit when it reaches him from Marilyn. Rae and Christiane processed Avtiin and Hort Azuur scans and they look great – Everyone did laundry today in the warm sun, and many had baths. Drivers worked on their vans as usual. There were no trips to town.

15 June 2007 (Khogorgo Gol)

We moved backwards today! We planned to finish our Khogorgo site in the morning and leave for Muren after lunch, but when evening came we were camped – sort of! – east of the Khogorgo at a herder's place out in the middle of the grassy valley floor. What went wrong was work and weather. The site work began well, but when we got down below the last rocks a leg bone showed up suggesting the rest of the burial was extended to the north. Expanding the dig in that direction produced only a cobblestone floor that was natural. Checking to the south in the loose brown soil I found a curious yellow-brown rock that I soon found was a skull – and we realized that the body was flexed tightly and was lying facing south on its right side with knees drawn up to the chest and body probably bound with thong, and the back arching to the east. We had to expand the pit in this direction and then slowly expose the bones. A few chert artifacts and flakes were associated directly with the burial but no really significant materials, at least that were preserved. The skull looked Mongolian and had only three teeth; otherwise the skeleton was not remarkable, but was quite short in stature. Bayaraa thinks the burial style is early Bronze Age – about 4000 years old, and this makes sense of the tiny microblades and thin, rather poorly-fired pottery, with check-stamped or dentate decoration. At least finding the flints and pottery within the burial pit makes sense and we don't have the messy situation of a Bronze Age and a Neolithic occupation in the same site. We found a horse rib yesterday and can date some human bone now so we should be able to sort out the chronology. The few thick ceramic sherds found near the surface are a post-burial component. At least that's how it looks now.



Chimba with skull of Khogorgo-3 mound individual, with good Mongol features. (photo: Fitzhugh)

The 'Mats' got interested in doing some soil studies in the middle of the field and excavated a pit to check the strata – this is because we found the interface between the brown and tan soil/silt was all at the same level – suggesting a lake deposit. They also excavated a test pit in a 10-12x8 meter depression 40 meters west of our excavation and found a 50cm deep deposit of brown loam with flakes and artifacts, charcoal and some unburned bone. They had not been able to reach the bottom when they had to quit. The rest of the crew backfilled the excavation and we frantically broke camp as a rain storm struck, quickly soaking everyone to the skin, just as the big tent came down. We raced to the ferry but the ferryman had disappeared into his hut on the other side of the river and would not come out. He knew what we knew also – that it was already too slippery to get the vans down the steep muddy bank and onto the ferry surface. After about a half-hour we decided to try our luck with some lodging at a herder's place, and eventually found a very prosperous family with a truck, motorbike and a TV run on solar panels, who had an empty cabin next to his house owned by another

guy who agreed to give us the key. We soon set up our stove inside and started to dry out. Amraa cooked a great soup/stew and some of us set up tents in the yard around the farm. There were lots of cows and horses. By bedtime the floor of the cabin was crammed and a major 'sleep-over' was underway with most of the Mongolian guys sleeping in pairs for warmth. Those who visited with the family next door heard their first news on TV of the resignation of the Mongolian Parliament Chairman.

16 June 2007 (Shishged to Belktes River)

We had a great night tenting on the herder's 'lawn'! Morning came with grey skies and misty rain. We may have to dig trenches to get the vans onto the ferry. I asked Adiya if we should offer to pay the family, but he said 'no, just give them some apples and other food.' They have a very neat and clean farm and seem like they don't have to move seasonally. They have lake frontage and plenty of water for the summer season, which, here in the northern Darkhad, is not dry even in summer, and they seem not to have any sheep and goats that have to be tended. The cows go out to the shore and return on their own in the evening, so this really is a farm, and their fenced yard keeps the animals from crapping all over the immediate vicinity of the house. Even the many outbuildings are well-placed and well-constructed, and new buildings are underway now.

The head, place is only a few hundred meters from the lakeshore, and just as we were leaving the family head, Batsuri, asked us to buy several kilos of whitefish, which they catch by net, so we'll have a good supper ahead if we can escape the mud. In recent years there had been an invasion of cormorants in this area of Mongolia, thriving on white fish which are plentiful in Tsagaanuur Lake. The local people consider their arrival a plague as they are in competition with the birds for white fish. We could see their island colony in the lake, looking black and ugly – devoid of vegetation and lumpy with the bodies of birds. They have the distinction of being despised almost wherever they occur.

The police are black-marketing gas in Tsagaanuur now, where there is no gas station. This is really better than having them after us all the time about being illegal and looking for bribes in cash – we got across the ferry without any problem, aided by a shovel trench for the tire to grip the earth. The breeze was blowing from Russia up the river. According to the ferryman the ferry has never broken loose from the wire and gone downstream. If it did, Tsog explained, "you'd better jump and swim – it's better than dying." The road was very muddy and it was a miracle none of the three vans got stuck. It rained most of the way through Ulaan Uul, where we gassed up and got the local restaurant – a one room shack to let us cook a meal and eat there, with her assistance, for ten dollars. We left about 6PM and made good time to Toms Bridge where it cleared, and we made camp at our site of 10 days ago. All of a sudden the clearing brought a cold breeze; but by this time we had a fire started and tents up and the fish from Tsagaanuur were scaled and cooking. There is still ice along the river bank here, and during the evening 6-7 vehicles passed by, some honking a greeting as we sat in the dark around the fire. The white fish was excellent but had been so heavily salted it needed soaking in fresh water to be really palatable. As it was it was barely edible...but tasty nevertheless. The boys got into cooking in tin foil over the open fire, with mixed results until we broke out the excavation screen and used it as a grill. Amra's version was floured and fried in oil and was great, except for the salt. After dinner a circle developed around the fire and assisted by a round of vodka, songs were offered up by the recipient of the cup. The Mongolians had a large repertoire and the Americans were rather at a loss, mostly the problem of thinking of titles and words. The lack of group singing, or singing at home, and the accessibility of music media has done in our communal

song culture, if there ever was one. We seem to have slid into a performance culture rather than a communal shared culture. Bayaraa has a very nice voice and enjoys singing and several others were excellent, Ugii in particular. A very cold night. It must have done down nearly to freezing. I discovered during the evening that Rae, during her ceramic artist phase, had met the Japanese ceramist, Toshiko, that my nephew Fitzhugh Karol interned with in New Jersey north of Princeton and whom Lynne and I had had lunch with at her place one day; Rae knew of her mega-pots and ceramic gongs and knew of her tradition of live-in young male interns who stoked her furnace and assisted/learned her ceramic techniques.

16 June 2007 (Belktes River Camp to Muren)

There was frost on the tent in the morning and a bit of a slow start for some who were up singing until 1-2AM. Three empty vodka bottles told the tale of the evening. The ride down to Erkhel was uneventful and took about three hours. We arrived at an old campsite to find Paula, Oyamaa, Oyumbileg, a student/cook, and a driver having lunch. At first Paula didn't recognize us and was shocked by the sudden arrival of three vans. My semi-bearded face in the window did not help. We caught up quickly and heard about her lichen mapping of the Erkhel and Khushugiin Devseg deer stones and are heading to Tsagaanuur tomorrow. They will be present for the Tsagaanuur festival and a trek into the taiga near the border where they were two years ago with Sanjiin and will document the big hunting ovoo there. Then we continued on to find Bruno's camp and discovered them at home – it being Sunday. This year he had a large group including David Hunt and Steve Young, whom I did not realize was coming to Mongolia this year. They all looked well – sunburned and grizzly – bearded from three weeks in the field. They have already dug a number of mounds, finding skeletal material in all, even in the looted ones (about half). The weather has been cool/cold and they had three inches of snow when they first came out. They have a cook ger and a worker, and spend 6-2 digging and the rest of the day processing and cleaning material. So far, there have been no floods like last year, even though the river level has remained relatively high. We then went on to Muren for baths, internet, and food supplies. The cell phones started ringing just beyond the airport. Christiane had stored up text messages for her boyfriend in Germany ahead of time and had barely sent them when she got a reply with good news about his academic work. The line up at the only internet place open – the post office - was too long for me to sign on, so I went off to buy lunches for the Mongolian crew, who needed lunch more than internet.

We finally got our chores done by 7PM, including another large gas purchase, and returned to Bruno's river camp to set up tents and have mutton stew cooked by his two cooks. Last year they were buying goats, but have shifted to more expensive mutton this year, with more funds available to satisfy the tastes of his team – most Mongolians prefer mutton, whereas Bruno was used to goat from his earlier work in the Near East.

After dinner our two teams engaged in an epic soccer match, for which Bruno's crew had been practicing under threat of loss of pay, and it seems to have worked, as they won 4-1, with Adiya scoring our only goal. While the game was taking place Bruno, Steve Young, Bill Stewart, myself, and Christie talked about Bruno's mound excavations – he's got about 8-10 dug now and all – even the looted ones have bones and no artifacts. The idea that mounds are not burials certainly does not hold water around here. It was good to see Steve Young, but he has caught a bad cold and has been pretty under the weather. He and Bruno tried to find the pingo in the Erkhel ravine from our 2001 trip but they missed the tight cut in the mountain and were looking too far to the east, north of Erkhel

Lake. He wants to check the peat deposit he found there – more than a meter thick and possibly arrange a student project for analyzing a section. I'd bought four cases/flats of beer as our contribution to the evening. They went quickly and I suspect were supplemented by private stashes purchased during the afternoon 'bathscapade'. The result was lots more singing and drinking by the younger crowd, which went on until 2AM and left quite a few with morning headaches. Fortunately, the weather was warm and there were no rain showers. Bruno's team got up at 6 and went to work at their mounds. Dave Hunt stays in camp documenting the bones with an assistant. Eliza Wallace is one of the crew chiefs and Bruno's New Zealand colleague. It's a very organized project, but has some troublesome elements with booze. I gathered from Bruno that the Russian work at the fossil hominid site was a bust and failed to recover any traces of new finds.



Khushugiin Devseg deer stone site excavations at Feature 2 and DS3. (photo: Fitzhugh)



Khushugiin Devseg with fallen DS3 (left), Fea. 2 (rear), and Fea. 3 (foreground). (photo: Fitzhugh)

19 June 2007 (Delger River Camp to Khushugiin Devseg)

Bruno's crew pulled out at 6:00AM to go digging and the rest of us got up at 7:30 and had breakfast in his cook ger. We then packed and left after the van arrived from Muren with the drivers who spent the night home with their families, bringing out firewood for the next several days. We had hardly got off before we had a flat tire – Tsog had picked up a small nail somewhere. The crew changed it quickly and we were off again, stopping at Paula's camp to apologize for missing her

last night; but she had already left for the Darkhat. We set up camp a short distance from the Erkhel east deer stone site, Khushugiin Devseg, on a plateau between the lowland and the hills, having a great view over Lake Erkhel. There are several herder winter camps here, all very well-kept, and after we got the excavation going we had several herders stop by. One told us of some other standing stones, and during the evening we went looking and found three at one site (circles, belts, tools, but no deer) and one above our camp that has a faint circle groove and has been looted recently. The afternoon picked up speed after the hang-overs passed and the weather warmed, bringing out the

midges, and my midge-bite polka-dots started emerging. By the end of the day I was looking ‘clownish’. Enkhbold began drawing the deer stone art at Khuushugiin Devseg, and by supper we had cleared and mapped the rocks in a 5x4 area that has a ring feature that looks like it will be a horse head burial, and a mostly-buried deer stone that as yet has no marks showing. So far we’ve seen none of the abundant pottery we found in last year’s dig near the northern deer stone. The evening is grand, with purple hills north of the lake. I wandered around above camp finding several khiriguurs and the ‘looted’ deer stone. Volleyball was in action now with roars from the ever jovial Mongolian students and our own crew. Looks like it should be a great day tomorrow. A sliver of moon has just appeared, and the wind is hardly a whisper.

19 June 2007 (Khushugiin Devseg)

This is the second day of work at this interesting deer stone site. The weather was gorgeous, clear and not too hot and most shirts were off and backs burned. Early in the morning the midges were out and we used smudge fires of cattle dung, which was more effective than my spray can of ‘Off’, which seems completely useless against them. They disappeared during the midday and returned in the evening. The day was tremendously productive especially for the south excavation. The Feature 2 mound had some large slab rocks under the mound and a horse head, one hoof, and a set of vertebrae, so we will get a nice date here. Feature 3 was a tight ring of large rocks about the same size as the horse mound and it contained only a single horse hoof – perhaps one of the three missing from F.1. Just north of this ring there was a small box-like hearth, and next to it a fallen deer stone whose upper corner was just protruding from the surface; we had not noticed it until we started to lay out the grid. Excavations yesterday were disappointing because when we exposed this stone it seemed to have its carvings eroded away. But as Sasha dug more of it out, deer figures began to appear, although the ones we can see so far are fairly eroded. It is a heavily ornamented stone in any case and should be a good one to experiment with scanning interpretation. Enkhbold spent all day working on the southern deer stone – the most beautiful and well-preserved of the two standing stones. He is finally getting down to business and using his art! So at least we will have one excellent controlled artistic representation of a stone. He is going about it very systematically and has gridded out the entire stone in ten centimeter



Enkhbold (left) and Bayara setting up a string grid for controlled recording of Khuushugiin Devseg DS1. (photo: Fitzhugh)

blocks using white thread and then is drawing from this controlled surface. The results look great so far. Excavating near the buried deer stone Bayaraa found a piece of a large ceramic jar – probably some sort of feast bowl, with interesting decoration. It’s a rim sherd so it has lots of information. This is the finest piece of decorated ceramics we have found in five years! Mat Sagi, Bill Stewart, and I worked on expanding last year’s excavation near the northernmost deer stone, where lots of utilitarian ceramics were found, up to 60-70cm deep. We opened 3 2x2’s and struggled all day in the heat to work through the overburden and get down to the original cultured layer. We succeeded in

some areas, but the soil is so compact that the struggle seems almost not worth the effort, if the result is only a handful of tiny potsherds. Perhaps tomorrow will be a better day at this location.

We worked till 7:30 – a long day. Adiya, Rae, and Christiane returned from Muren where they succeeded in scanning the 15th deer stone from Ushkiin Uver – the one that had been stolen and recovered and is in the Muren Museum, stored outside in an old animal cage that used to be a part of the museum zoo operation. They had all sorts of red tape and contract-writing to do to get permis-

sion, and in the process discovered problems with our local archeological permit, which Bayaraa had not tended to when we arrived here to start work in Muren. Adiya got things patched up but we still have some hoops to get through. Rae, Adiya, Christiane and Christy left after supper to scan the deer stones at the “Erkhel South” location – an all night operation, I imagine.



Tumst deer stone site excavations. (photo: Fitzhugh)

20 June 2007 (Khushugiin Devseg)

Another great morning. The scan team arrived back at 4AM. “Shadow” lightning was flashing in the

clouds to the north when I went to bed last night.

GPS #311 Looted deer stone east of camp on the ridge (1742m; N49°54.881’; E100°03.648’). This deer stone is inclined to the west, about 1m exposed above ground. No clear deer stone marks are visible on the rough, white granite slab, but there is a suggestion of a ring near the top of the north side. The top is angled with that facet faces east. A red quartzite hammer stone, heavily battered on its ridges lay 1m to the southwest, probably excavated from the looter pit at the base of the deer stone. A second looter pit lies open excavated to 50cm and 2m in diameter 3m south of the deer stone. There seems to have been a boulder feature here, but I saw no evidence of horse bones or other cultural material. There are two other boulder features southeast of the deer stone that have not been looted. I took photos to the south, northwest (with L. Erkhel) and a shot of deer stone to west. A granite outcrop 25m north of the deer stone may have been a quarry and one large slab shows a fault or parting plane extending into the main body of the stone, which also has a naturally angled top.

With a larger crew we were able to finish the Feature 1 excavation by mid-afternoon and found some interesting ceramics at the base of the topsoil near the bottom of the pile of stones that comprised Feature 1. This pottery was not an exact match with the type Bayaraa found in Feature 2B, but it was a similar and had some decorative bands instead of incised decorating. We were able to fit several pieces together including some rim sherds and could tell the vessel must have been quite large, perhaps a festival feast bowl. We now have one such bowl from each feature area, and the means for dating each. In the afternoon we went to the other deer stone site mentioned to us by a herder – Tumst – (GPS #312 1819m N49°53.482 E100°03.862) was on a ridge overlooking the valley west

of the Muren-Hatgal road and was occupied by 10-12 ger families, so the area must be a productive place to support that many families. The ridge is not a very prominent place though and cannot be seen from the valley, nor does it have much of a view. There are quite a few khirigsuurs in the area. The deer stones may reflect this situation, and are not well-finished stones, and have rudimentary marks and carvings. There's belts and a few tools, and belt-like grooves for the necklace line rather than pits, and two have three slashes /// (not two as in many other cases); but this mark is common in these sites in place of the face. We excavated a 2x6m section of rocks that seemed to be a distinct feature east of the deer stone settings, but we found no signs of activity below the surface – just eroding slab rocks from the ridge top. Perhaps these folks were too poor to offer horses to the dead. While we were digging an old gentleman in a del came calling and he turned out to be the same fellow who visited us at Khushugiin Devseg last year. This time he was a bit into his cups with vodkha and wanted to drink with Sasha and Bayaraa. He stayed on quite a while haranguing about this and that, to the amusement of the crew. This site contained some naturally-eroded flint stones in the soil, which I kept and had drilled as a necklace for Christie Leece when she left Washington for Chicago in September.

We returned to camp and tipped up the new deer stone so Rae could scan it tonight. There were more deer, but the condition of the stone surface was not much better than the side that was up. The boys backfilled the excavations so we could photograph them and show officials in the sum center of this region that we had dutifully filled our holes. Rae and Christiane started scanning at dusk and made good progress on this stone and the southern stone, finishing at 2AM. Great sunset and treacherous looking clouds flashing with lightning, but it never rained. Amraa cooked a great spaghetti dinner for the American crew and Rae and Christie contributed bottles of red wine they purchased in Muren, a tasty treat. I phoned Lynn and Abby – all is well on those fronts.

21 June 2007 (Khyadag Deer Stone Site)

On the way over we stopped for water at the public well near the southeast side of the lake, following a herder who was finishing watering his sheep. A hand pump raises water from 16m under ground with ease. Then we left for the Khyadag site and its two sets of deer stones – three in the



Khyadag DC site, eastern DS group, showing many small broken deer stones. (photo: Fitzhugh)

western group and two in the eastern group, one of which is broken in half. All three carvings in the western group have earring pendant lines. The small deer stone and the west side of the large deer stone in the east group have pendant lines, and the north side of the big stone has a groove circle "O". The eastern group (GPS #313 1598m; N49°48.900'; E99°54.042') faces northeast/southwest magnetic. The two stones standing here are aligned in a north – south line magnetic. There are many other smaller standing slabs, badly eroded and broken off at the base, aligned ~215°. The southern one is smaller and broken halfway up, but the top piece is present and fits.

There is a large mass of rocks in a pavement east of the stone, and we chose to excavate a 6x3m area here since there are no obvious horse mounds. So far no structures or features have appeared, and



Khyadag DS East site pavement excavated.

the subsoil is quite close to the surface. Nevertheless, we did find several pieces of bone, including one sheep/goat leg bone. Our excavation was terminated abruptly when a jeep came screeching to a stop at the edge of the pit and an officious young guy hopped out and told us to stop digging. We told him Bayaraa has the permit and is in the sum center getting the papers signed as we speak, but of course he points out the obvious – that papers are to be signed before digging begins. Bayaraa was one day late in getting to the officials! These are the same guys that have been giving grief to Bruno for the past two years. This is a new provision of the archeological permit that requires local approval of the national permit because of some misdeeds of the past in which archeologists angered the local people. It's a fairly powerful tool and causes lots of nuisance when not observed. I've left this business to Bayaraa in the past – and Adiya – but with our broad-ranging surveys and discovery of new sites in small sum areas, it's hard to keep ahead of the local permit game. We had to wait hours for

Bayaraa to return with permission, and after hanging around the site for an hour the guy (who would not identify himself to us) and his driver told our students he was not really an official anyway. He's just sort of a self-appointed nuisance-maker playing power games. At any rate, he said he would wait in a nearby ger where he would watch us to make sure we did not dig. He wanted to check my notes but did not demand the bones we had found. Bayaraa did not return by six so we went back to camp and will hope to clear this up on our last day – tomorrow. In the meantime Bill Stewart and I mapped the western deer stone group and found it had 23 outer ring features and a band of rock pavement, mostly centered on the big deer stone – almost like a khirigsuur. The complex has a broad, straight-ish 2-3 meter band of cobble pavement southeast of the deer stone, like the pavement we are digging at the eastern group, and like the one we excavated yesterday at Tumst. Rae was busy making notes on the deer stone, and she and Bill were scrubbing them with toothbrushes to remove loose lichen and



A feature full of Mongol boys lounging at Khushtiin Devseg Fea. 3. (photo: Fitzhugh)

dirt. All our trouble began when several local people came by and made inquiries, and they must have reported us. Bayaraa returned from the sum center about 7:30 with ‘not very good news.’ The sum chief had gone off to China and there was no one to sign our permit, so he went to Muren to the governor’s office and got reprimanded for various minor permit and reporting infractions. Normally they told him we would have to pay a \$200 fine, but they would let us off with just 30,000 tugriks! However, Bayaraa has another plan: we will operate under Bruno’s permit since we are in their sum and have made plans to have Tugso accompany us tomorrow with his permit papers, hoping that our SI-affiliations will work. We’ll see.



Khyadag West deer stone group. (photo: Fitzhugh)

After dinner I played soccer with the team – the first game of soccer for me in maybe 20 years. I felt pretty clumsy but did not disgrace myself completely. Hatbataar (“Hot Butter” – or known to some as ‘Hot Pants’) left with Adiya, Rae and Christiane, and Bill Stewart to scan the two largest deer stones at Khyadag hoping that photography would not be an infraction. They’ll be at this all night, then go to Bruno’s camp to get Tugsu and his permit, and drop Bill Stewart at the airport for his flight to UB – He does not want another long van ride. There was some celebration last night – honoring the summer solstice. Bill Stewart made some calculations about the orientation of the deer stones and the position of the sun at solstice. We’ll see what he comes up with after he gets home and plots it out.

22 June 2007 (Khushugiin Devseg)

This morning we got to the Khyadag site a bit after 9:00 and to finish yesterday’s dig. We had hardly begun when the crazy motorbike herder who gave us a hard time yesterday showed up with an axe strapped to the rear of the bike, “Stop and get out or I’ll shoot you,” was his greeting. We told him to get lost and that he was causing us to lose two days work with our large crew and he would be billed for it soon. That cooled him considerably and he sped away. The so-called official never came by to harass us, and Tugsu had come with his permit from the sum just in case. Bruno allowed him to come only for three hours, and he left at 11:30 to get back to the burial mound work, backfilling the large square khirigsuur we saw them working on last summer. Backfilling the huge rocks at that site is quite a chore.

Just before returning to camp after backfilling our site, Sasha found deer stone marks on several of the small broken standing slabs northeast of the large deer stone. They have pits, face marks (//) and sometimes a circle groove (“O”). Most are broken off at the base just above ground, and when you look around on the surface, pieces can be fitted together with the stones – made of the same poor quality, crumbling granite, like the big stones. They stand only 40-50cm high, but are rectangular in

cross-section and have circles on their north-south broad faces and some have // on their east sides. There are about 12 of these small deer stones in the Khyadag east group, in addition to the two large stones. This is the first time we have found miniature deer stones south of the Darkhad.

On the way back to camp we found a single stone (GPS # 314: 1581m. N49°54.138', E99°57.723') at the end of ridge upslope from herders winter place south ½ mi of the L. Erkhel well. No marks were noted. After getting water at the well and a leisurely lunch the entire crew except me and Sasha went off on holiday 'junket' to Hatgal and Lake Hovsgol to celebrate the close of our project. I stayed back to watch camp so Amraa could go, and to wash my clothes and take a bucket bath. After that I climbed the hillside to one of the big eroding granite clumps and wrote notes. A light breeze is blowing from the west and thunder clouds are passing to the south. Sunny here and so quiet you can hear the cuckoos calling from a forest patch over a mile away. The only real persistent sound is the buzzing of flies around me. Fortunately only the gnats are biting, and they're not bad when the wind puffs. I can see the closed-down ger camp on the Hatgal road, and every 5-10 minutes a van or jeep lays a strand of dust as it passes; but mostly everything for miles around that I can see, including Lake Erkhel is still and without movement of people or animals. Everyone is herding elsewhere and our camp are is in their winter grazing range. It's 6:31 in the evening, and about 70°F in the sun. I can see clear to Ulaan Tolgoi, the ravine leading to the Darkhad, all to the west, and behind me the view east and south is blocked by a high ridge of crumbling granite. The lack of glaciations has had a huge effect in creating this ancient eroding landscape of crumbling granite hilltops and ridges surrounded by smoothly-contoured-and presently green-grassy slopes that give Mongolia its special look and the resources for so many hoofed critters.

Two days from now we'll be in dirty congested UB! – One of the larger khirigsuurs in this area is just below me, about 500meters away. It's lumpy granite rock mound looks very much like the eroding granite outcrops in the nearby ridges and if it weren't for the contrasting pattern of it's square fence and the eleven clumps of boulders along its east side, you'd think it was just another natural feature of the landscape. This is GPS # 315, a square khirigsuur northeast of camp and the Khushutin Devseg deer stone site, looted with large capstone exposed. Very large granite rocks make the mound; 1741m elevation N49°55.117' E100°03.571. The site has fence corner features but no standing slabs. West fence is 13m long. This is the end of my sunny evening spree, as I am being consumed by gnats! Soon the crew returned from an enjoyable trip to Hatgal where they saw the "sheep museum," climbed the hill overlooking town and the lake, and generally goofed off, having fun snapping pictures of each other – memory shots. Not a lot of tourists around. It's still early perhaps. They brought Sasha and me some Horshur and smoked fish, a Hatgal specialty -very tasty! By evening my wash had dried and the camp was somewhat organized to start the trip home. Ominous clouds and lightning to the south, but it never reached us. The moon had reached half and was surrounded by a halo of haze, suggesting some cloudy or rainy weather ahead. By morning it was overcast but not threatening.

23 June 2007 (Khushugiin Devseg to Hierhan)

The Mongolians were up at 5:30 clattering around and packing camp. As the vans approached camp last night they encountered a large herd of camels, and this morning the camels appeared above camp as we were having breakfast. They stopped for quite a while watching us. Somehow their gait and attitude is timeless – or at least time-slowed, like they live in a world that is much slower than ours now. When you approach them they don't get skittish and run, but study you closely, just like you are always studying them. Then they move on, slowly, into their different world, like some

comet from an ancient past. We arrived in Muren at 9:45 and got showers and a few supplies. Chimba, Tsog's son, was going to stay home in Muren, and Erkhbold. Amraa's husband joined us for the ride to UB, and Tserenam and Bayaraa took a different route home, like ours of last year, to see wives (Tsera) and relatives (Bayaraa), whose ageing grandmother we met last year. Deegii, Sasha's niece (of sorts), had arranged a lunch for us at her parents' home in Tocontsengel: yogurt, mutton and noodle soup, as well as some interesting conversation. They had her sports medals on the wall and a beautiful old wooden chest with Chinese or Buddhist emblems painted on it. Ayush was semi-joking about wanting to buy it for the museum. Her father had been a driver for officials during the Soviet times and also trained horses on the side, which he still does, and has had many winners. His wife is a school teacher. Most of the time they entertained us he had his shirt rolled up over his ample belly as is the custom for Mongolian men when they are too warm. There are some strange manners here. Both remembered me from two years ago when we found ourselves caught in the midst of their annual naadam horse race. Apparently I was something of a spectacle, climbing into the judge's platform to shoot the end of the race. I'm not sure if Sasha was with us then and they may not have known of any connection, but I guess it's the first time a naadam in Tonsontsengel got videotaped.

We crossed the pontoon bridge at the Selinge River and soon found the wind was behind us blowing about the same speed as we were driving. As a result, the van's engines over-heated and we had to pull over, discovering a leaking tire in the process. Ayush cut some birch on the top of the hill to use in his birch bark exhibit, and we observed huge ant mounds and other natural wonders while waiting for him. Then a long bouncing drive through Rashon to Hierhan where we camped along the Khunuy River, a nice site with a rippling stream that seemed to be mostly cattle piss. Well perhaps not quite as there had been a thunderstorm in the area the day before so the water was higher than normal, and it was good enough in any case for it to be boiled to hydrate our instant noodles. The abundance of dead willow branches made our campfire a pleasant treat on the last night staying out in the country.

24 June 2007 (Heirhan to Ulaanbaatar)

We had an early morning rise, nearly at sunrise. Ayush was not feeling well and remained sick most of the day, and Tsog tried to make him feel better at one point when we stopped near Khan Bulk Balgas after he almost exploded from Tserenam's van when it pulled up and curled into a fetal position in the shade of the vehicle. He wouldn't eat lunch, only water; but a couple hours later he was happily eating a hot lunch at the roadside restaurant the drivers like to stop at just before getting into UB – a place called “Delicious”.



A single deer stone found east of Hierhan at GPS316. (photo: Fitzhugh)

We took a slightly different route, west of the normal run between Kierhan and Ulzyt, and in the process had to ask directions from herders who kept asking us for refreshments, even though it was

barely 8AM. The drivers were also on the prowl for some airag, as this was good horse country, and naadam was approaching. But while we met several early morning drunks, none of these folks were making airag. In one of these locations, east of Hierhan, over the first range of hills east of the town we came across a well-preserved deer stone, whose base was guarded by a lush growth of nettle, to my stinging surprise. The site was on a small bench in the east-facing side of the hill, overlooking a flat horse-grazed plain and a herder's camp (GPS 316: 1608m; N48°23.709'; E402°11.860'). The stone has a deeply carved deer chevron on its northwest side, a grooved circle "O" on its southwest side, and lots of associated boulder features around the east and south sides of the stone, and big rocks around its base.

Further east in the same valley a solitary craggy granite hill rises from the plain with its eroded slabs tumbling down its slope sides almost 560-600ft above the valley floor. Along the south side are many khirigsuurs and a Tibetan rock inscription (GPS 317: 1457m; N48°20.229'; E102°19.602'). Slightly further to the southeast was a large expanse of ruined land that had been farmed in the Soviet era, and due to lack of sufficient rainfall or irrigation had dried up and become a wasteland. In the middle of this area an abandoned threshing mill stood in ruins. All around the weedy/sandy field area the natural grassy steppe was in fine condition. One of the many grant development schemes gone awry. Passing one of the large lava fields west of the Khan Bulk Balgas we saw many khirigsuurs, and again in the volcanic terrain near Khan Bulk. The final approach to UB, as always, seemed endless; but we arrived at the Zaluchuud Hotel about 8PM, got settled and went to eat at the Indian restaurant, accompanied by Bill Stewart, who had arrived in UP three days earlier. He and Matthew Rasmusen will stay in UB for a few more days after we depart. Mat goes on to Beijing and Japan visiting and sight-seeing. He's worked hard on his 'field notes' which include observations, artwork, and other materials, a most talented kid. My room this time at the Zaluchuud is on the rear side where the disco place blares its trashy music, but fortunately, they close at midnight.

26 June 2007 (Ulaanbaatar)

I met Adiya at 9:30 and figured out the salaries for the crew – the big money drain begins with all the crew salaries, drivers and Adiya's bill. All morning I kept running to the bank for more money. Bayaraa had returned from a quick visit to his family in Jargalant. All was well there. Christie inventoried the archeological collections and selected the C14 samples I'll bring home to date. Rae, Adiya, and I paid a visit to the Cultural Heritage Center located in the White House next to the contemporary arts museum, and we had a good meeting with the new director, Enkhbat (Enkhbat@monheritage.mn), who is young and dynamic and full of plans to compile moveable and immoveable objects collections through Mongolia. He seems to be coordinating well with the National Museum and the Archaeological Institute and has a long-range plan and support from the government. We talked about some cooperative programs relating to deer stones as a subset of his larger plans. Outside his office we found ourselves in the middle of an exhibit opening produced by Ganna Natsag's team. A medieval warrior costume and illustrative costume artwork, weapons etc and sure enough, at center stage was Ganna's metal-smith sidekick and partner! The show looks like it will be a popular one. Ganna was off somewhere working on his Tsam masks. At 6PM everyone gathered at the museum, where we had pizzas and horshurs delivered. Adiya and I had got beer and sodas at the food market. We discovered Bryan Miller was in UB preparing for his field season at a Xiongnu cemetery in the Altai, and Christiane, who had finished her PH.D at Arizona State and had landed a teaching position in China for a year, was starting a survey of Western Mongolia to identify geological signatures and contemporary animal bones – teeth mostly – so we all went across the river and found a place for a round-up picnic. After a round of thanks to everyone – including our drivers and Bayaraa and Adiya's families – I made a toast and only then discovered that the Bavarian 'beer'

I bought was cider. A big joke on me, to say the least! Perhaps only Adiya, a teetotalling Mormon, was pleased. Nevertheless we had a great time and said our goodbyes. At 8:30 we returned to the Zaluchuud, finished packing our bags and arrived at the airport by 10. In my haste I ended up at the airport with many more tugriks than I had planned, and so loaned 200,000 to Rae to pay her excess baggage. The remainder I passed through the barricade to Adiya to cover costs later in the year. Somehow I had also failed to transfer my Swiss army knife to my checked baggage, and found it still in my pants pocket. I've had that knife for decades, and did not want to lose it. What to do? Use it or lose it, I thought, so I dumped it into my sachel and shoved it into the x-ray machine and emerged without questions. Arriving in Seoul I transferred it into my camera bag, and had a bag check getting on the Korea Air flight. No problem! Then I discovered my Seoul flight was not direct to DC but took me through Atlanta. I watched *Apocalypse Now* en route, a gory, melodramatic American Indian offering by Mel Gibson criticized by anthropologists for its unrealistic, overly blood-thirsty rendition. But what the hell! – it's just the movies!



View of our camp in the hills east of Lake Erkhel at Khushugiin Devseg. (photo: Fitzhugh)

This year's Mongolian project was a great success and extended our knowledge of deer stone rites into the northern Darkhad with samples that should date these sites, with smaller and differently-marked deer stones. The Altai date add an important comparative dimension and demonstrate different deer stone and khirigsuur traditions, as well as the new problem in securing dates from these sites, which lack horse burials. We also have a new early Bronze component at the Khogorgo Gol site – with a strong micro-blade and ceramic tradition, and a good collection of ceramics from the Khushuugiin Devseg site. Most deer stone sites investigated produced bone, tooth, or charcoal samples, but only one horse head from deer stone 2 (south) at Khushuutiin Devseg. The scanners got lots of deer stones documented, and we found many new small as well as some large stones, small ones for the first time south of Darkhad at Khyadag site. We obtained two human skeletal samples, early and late(?) Bronze Age, found evidence of a large Neolithic site at the ferry crossing on the Shishged and got a good introduction to the Altai region – interesting survey results from Altai khirigsuurs and deer stones. All in all it was a great season!

Acknowledgments: *The 2007 Mongolia Deer Stone Project owes its success to organizations and individuals too numerous to name. Funding for the project came primarily from the National Geographic Society and the National Museum of Natural History, Smithsonian Institution. The National Museum of Mongolian History supported the project in many ways, as an institutional partner and through the work of its talented staff, Director Ochir, its curator, Bumaa, and professional staff Bayarsaikhan and Ayush. The American Center for Mongolian Studies (Bryan White and Enkhbaatar) provided assistance and advertising for our scholarly symposium. I especially thank our*

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Mongolian and American field crew for their dedication and hard work. These include Sanjmyatav, Boldbaatar, Chimba, Deegii, Enkhbold, Lkhagva, Onoloo, and Uгна; our drivers Tsog, Tserenam, and Hatbaatar, and in the Altai, Berekhbol; Matthew Rasmussen, Matthew Sagi, Bill Stewart; our cook Amaraa; our Altai field assistant Amra; most especially I thank my assistant Christie Leece and my Smithsonian colleagues Harriet (Rae) Beaubien and Christine, and Paula DePriest. Elaine Ling, Marilyn Walker, and Wayne Paulsen also made important contributions. The project could not have taken place without the hard work of our project manager, Adiya Namkhai and his staff and friends.



Tsagaan Us deer stone made into ovoo.

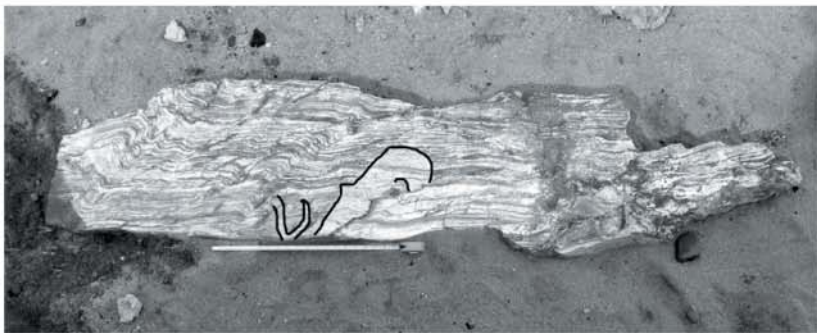
PART III

Field Notes and Maps

1. Sariin Tal, Tolbo Nuur Sum
2. Tsagaan Gol, Tsengel Sum
3. Tsagaan Chuulot, Sagsai Sum
4. Avtiin, Tsagaanuur Sum
5. Hort Azuur, Tsagaanuur Sum
6. Khogorgo - 3, Tsagaanuur Sum
7. Khushuutiin Devseg
8. Tumst
9. Khyadag

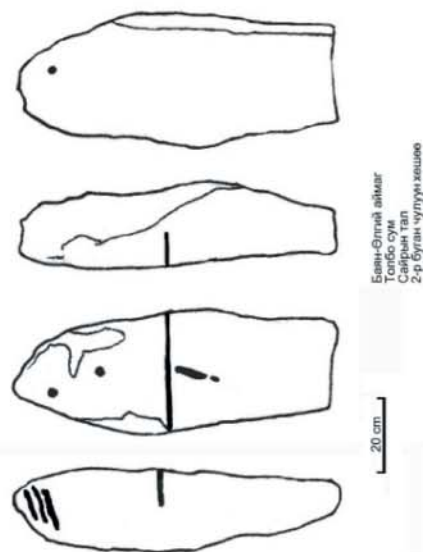
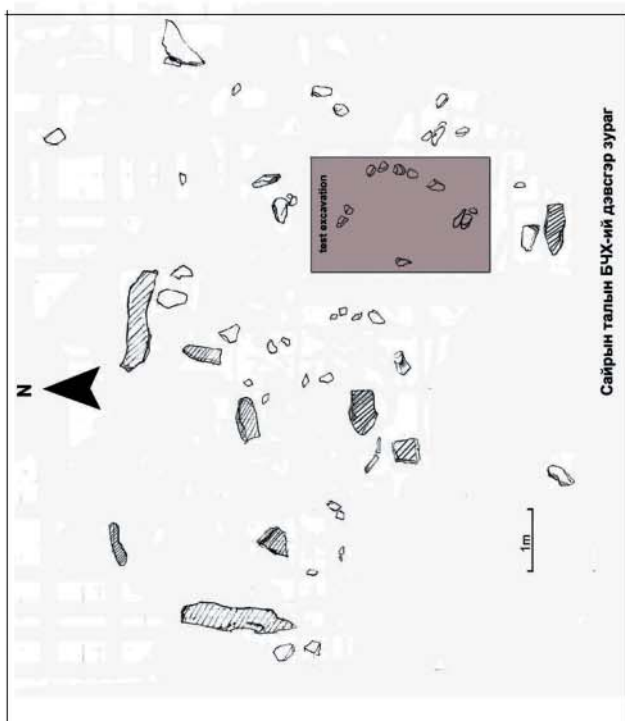


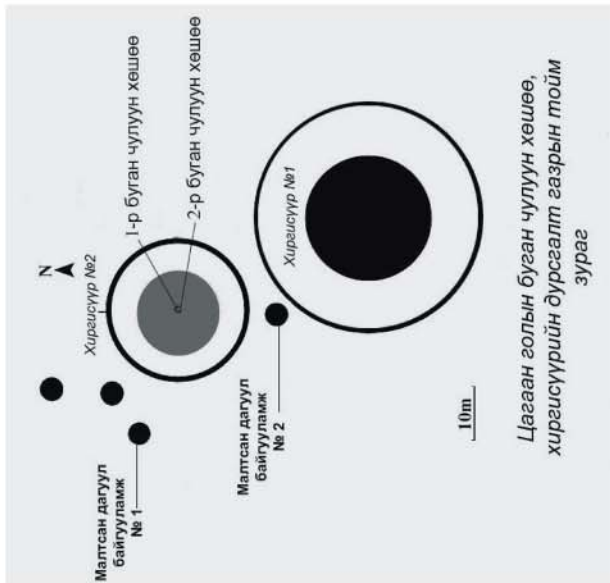
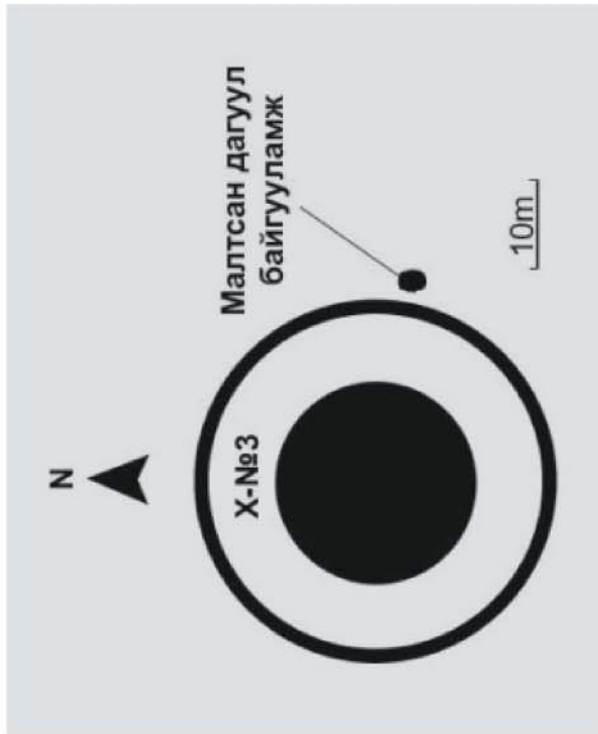
Bill Fitzhugh inspecting East Ridge rock art site.



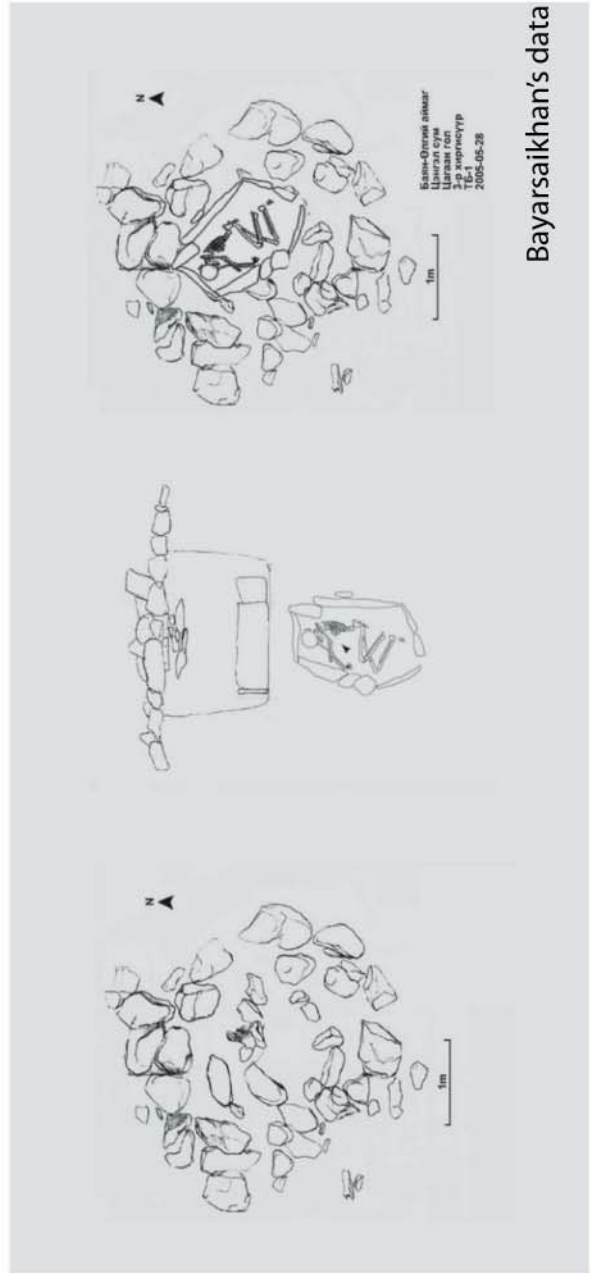
BAYANULGII
TOLBO SUM
SAIRIIN TAL

Bayarsaikhan's data



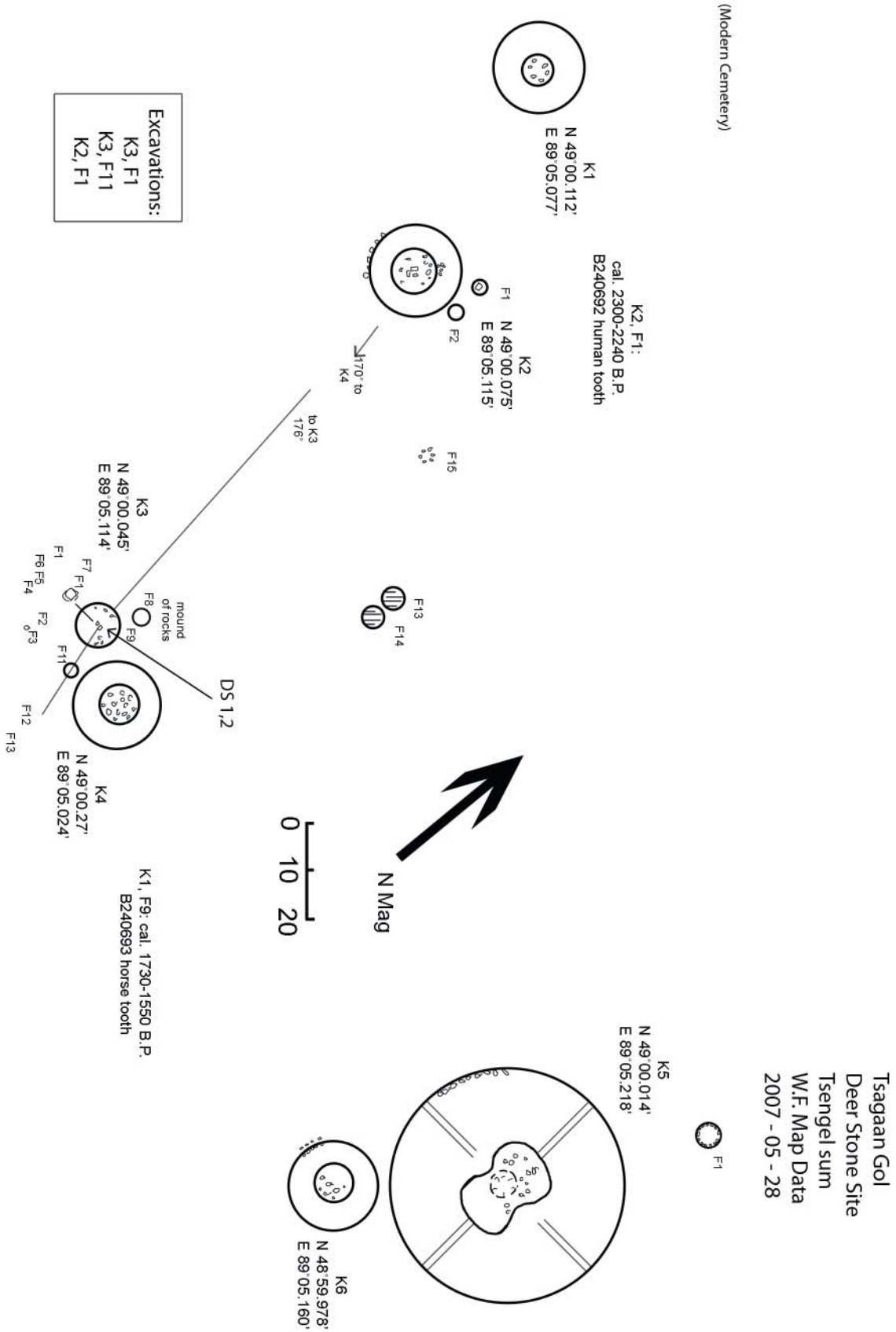


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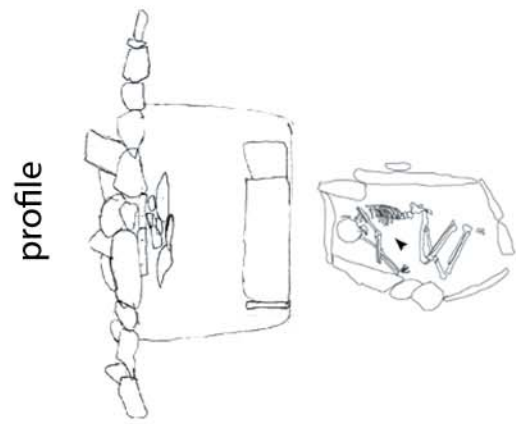


Bayarsaikhan's data

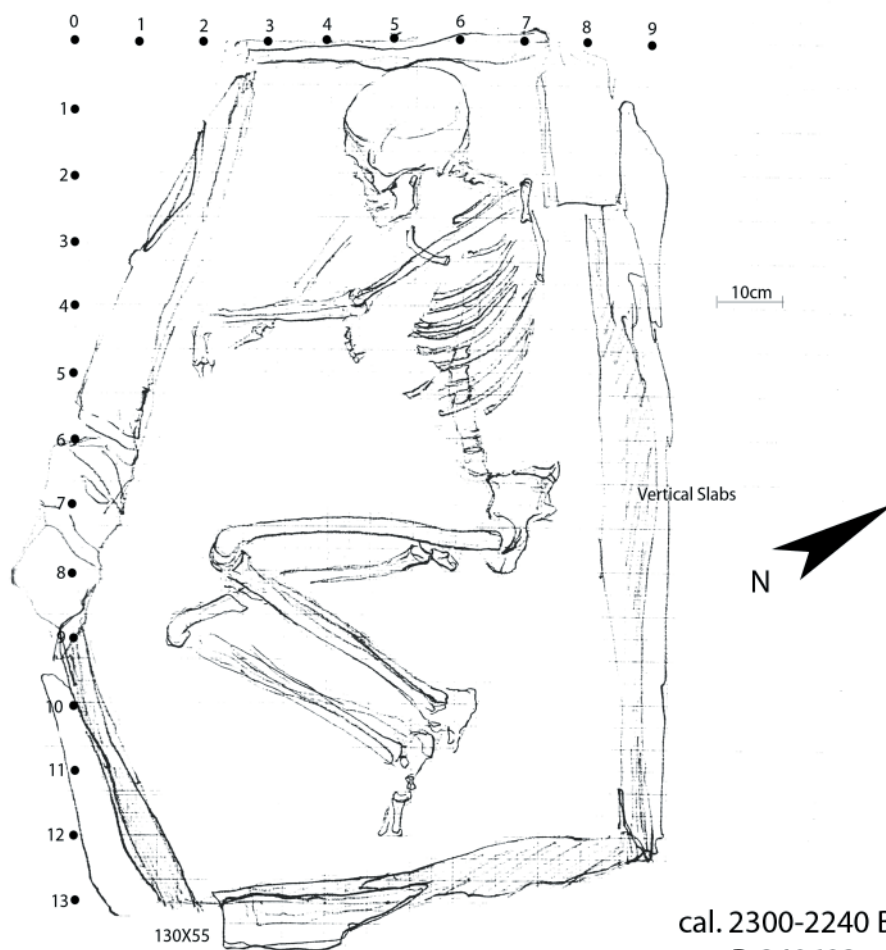
Mongolia Deer Stone Project: Field Report 2007



Tsagaan Gol
Khirigsuur 2
Feature 1
Bayan-Ulgii
2007 - 05 - 28
(Bayaraa's Map)



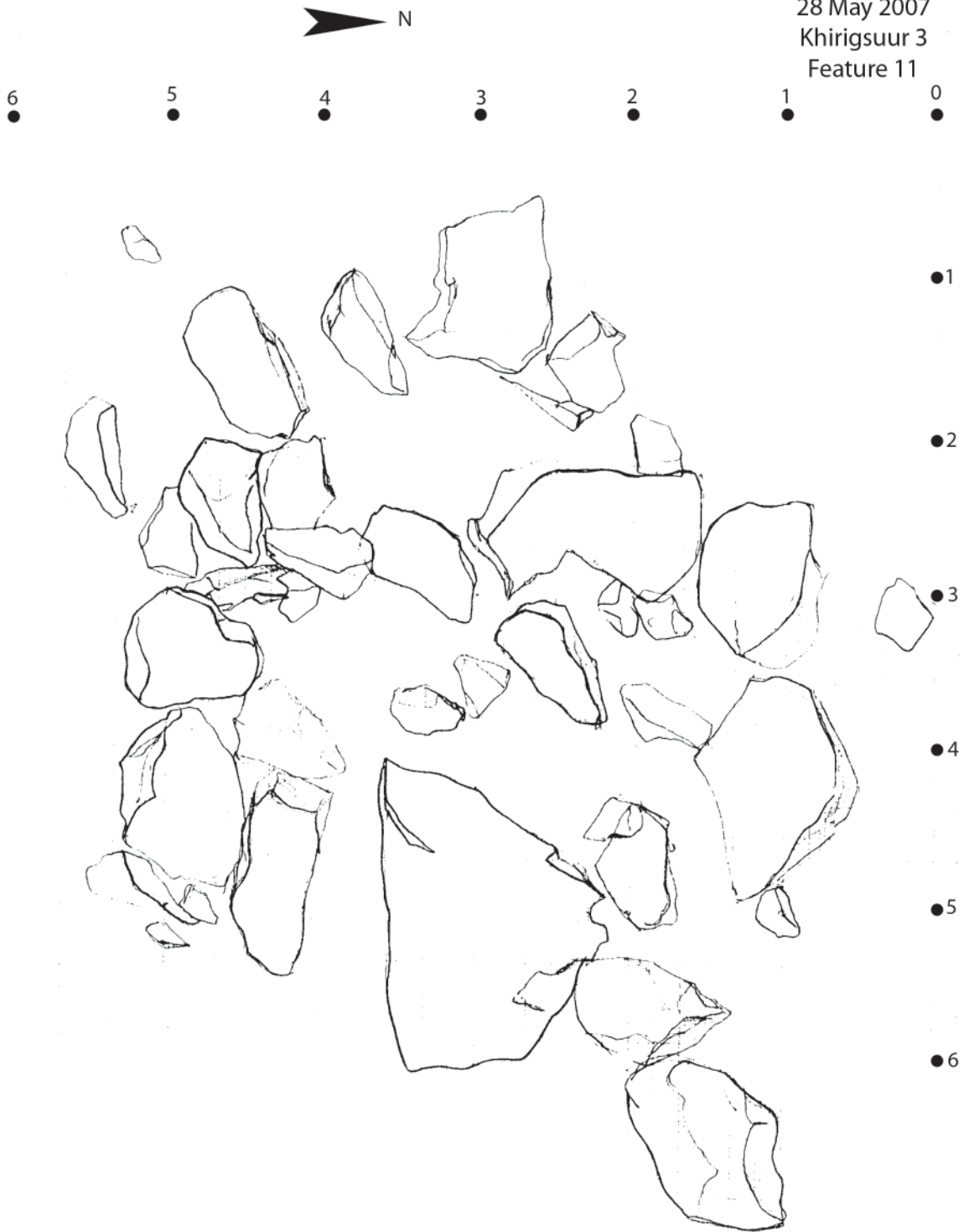
Tsagaan Gol Site 1
Bayan Ulgi
Khirigsuur 2
Feature 1



Burial box composed
of vertical slabs

cal. 2300-2240 BP
B-240692
human tooth

Tsagaan Gol Site
Bayan Ulgii
Tsengel Sum
28 May 2007
Khirigsuur 3
Feature 11



Tsagaan Gol
Tsengel Site
Bayan Ulgii
28 May 2007
Khirigsuur 3
Feature 1
Level 1

• 4

• 3

• 2

• 1

• 0

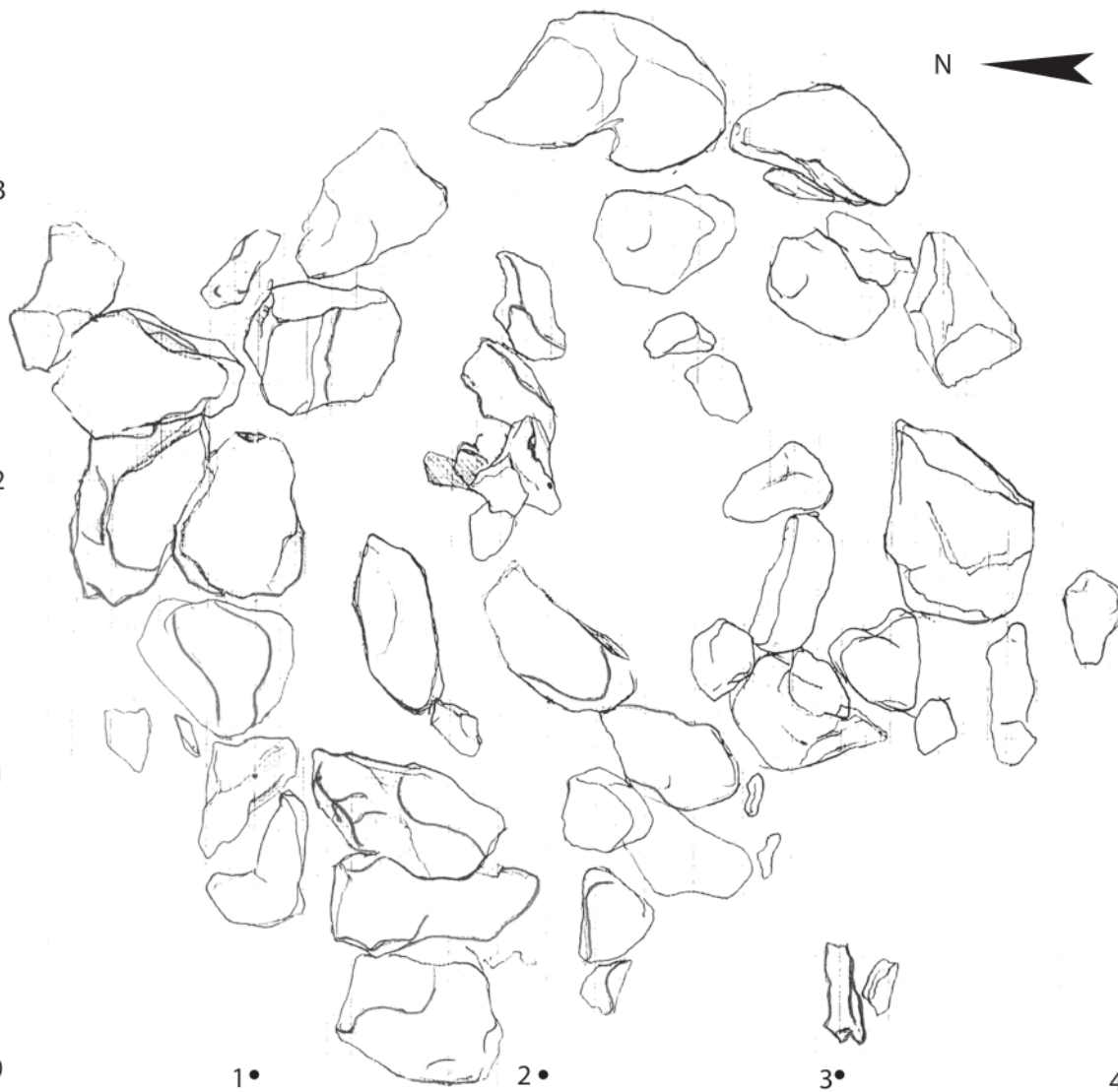
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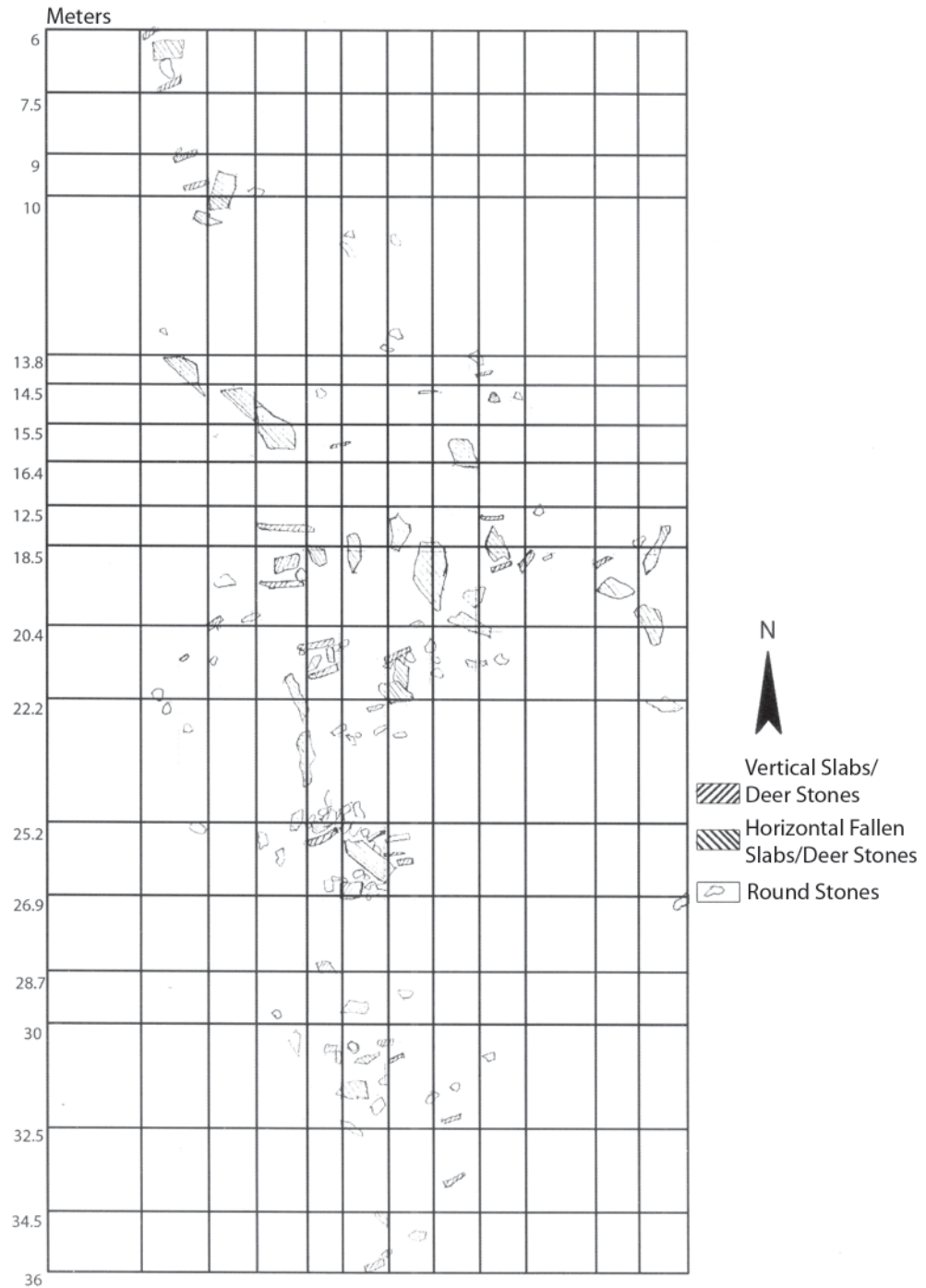
Tsagaan Chuulot

Sagsai Sum

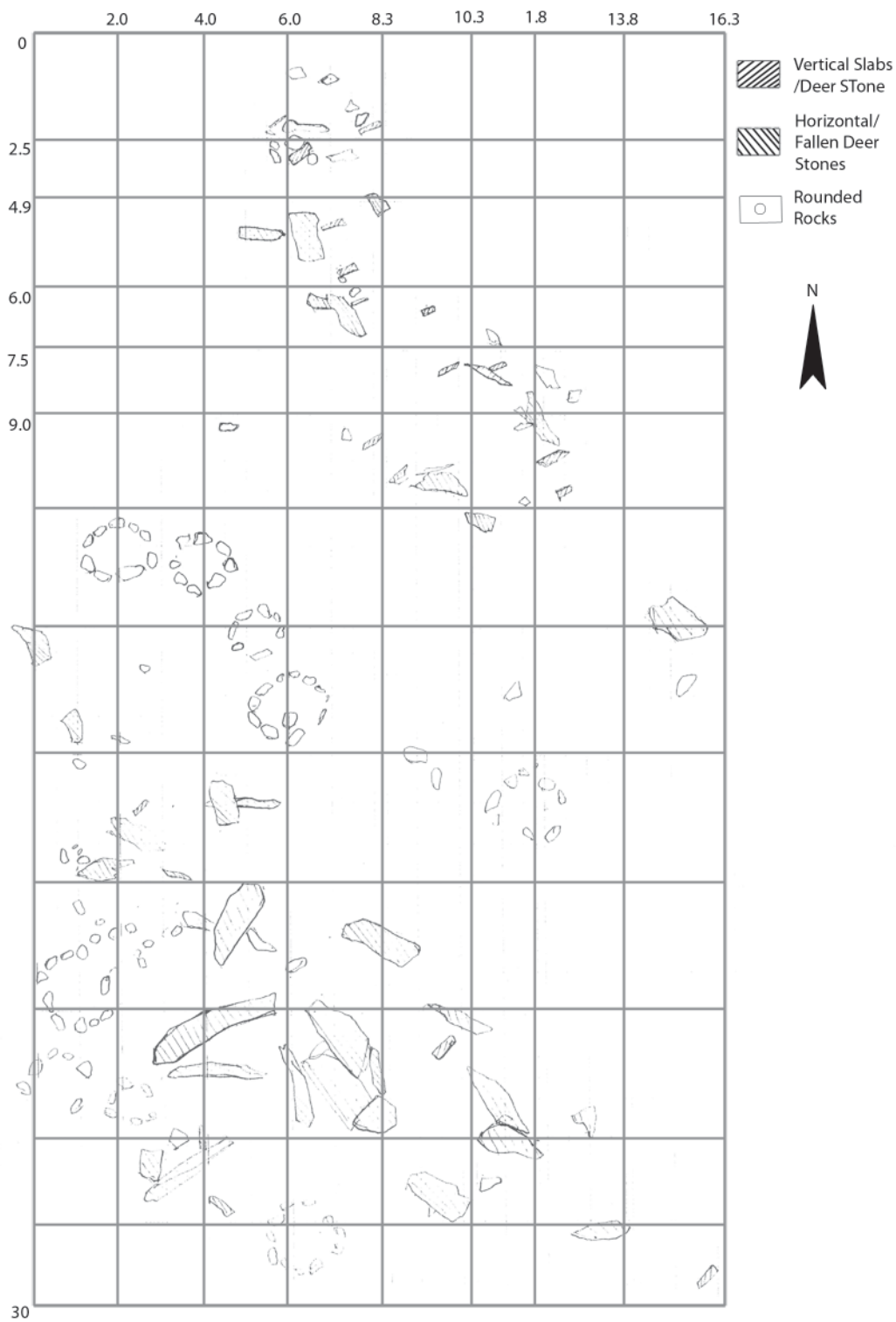
30 May 2007

Deer Stone Alignment

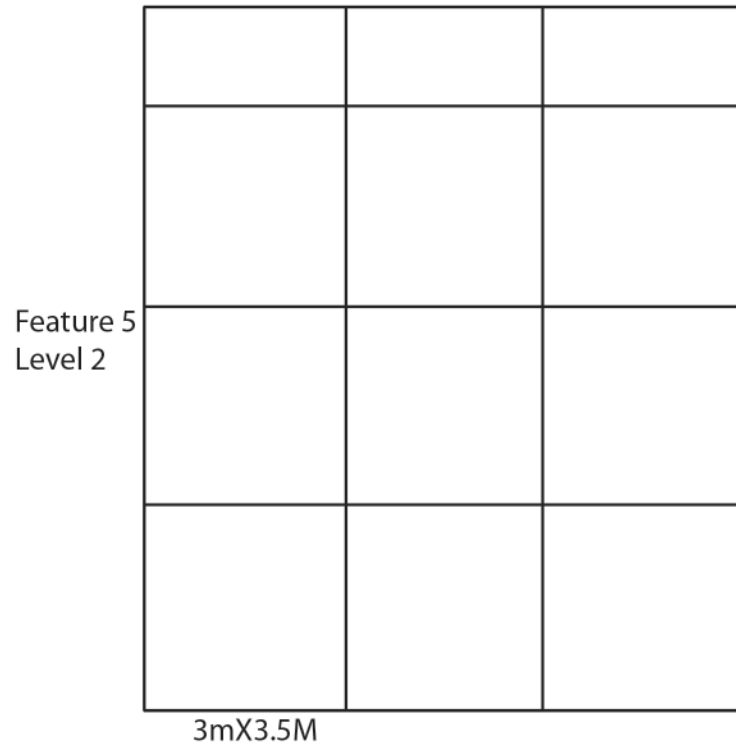
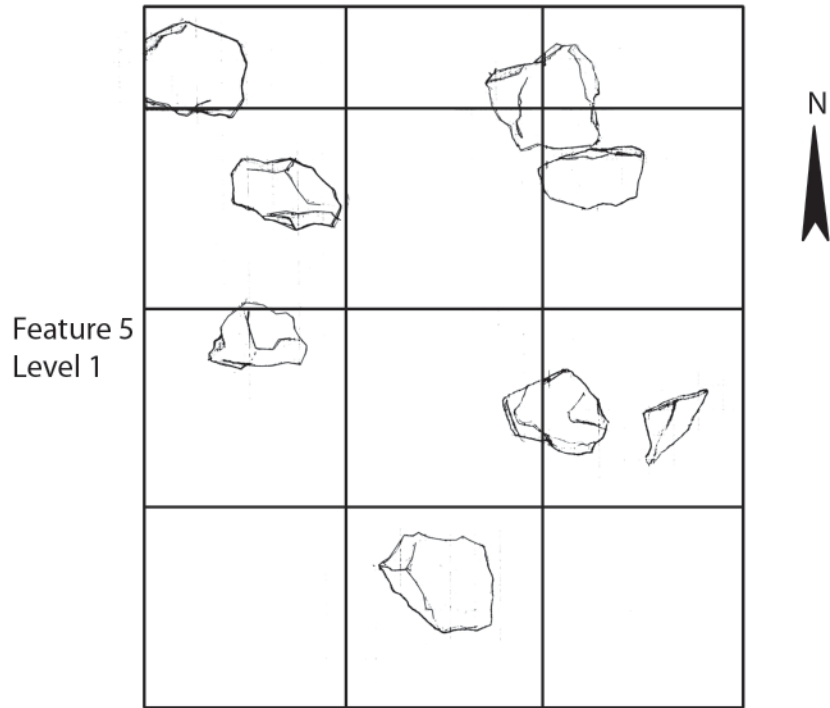
Bayan Ulgii Region



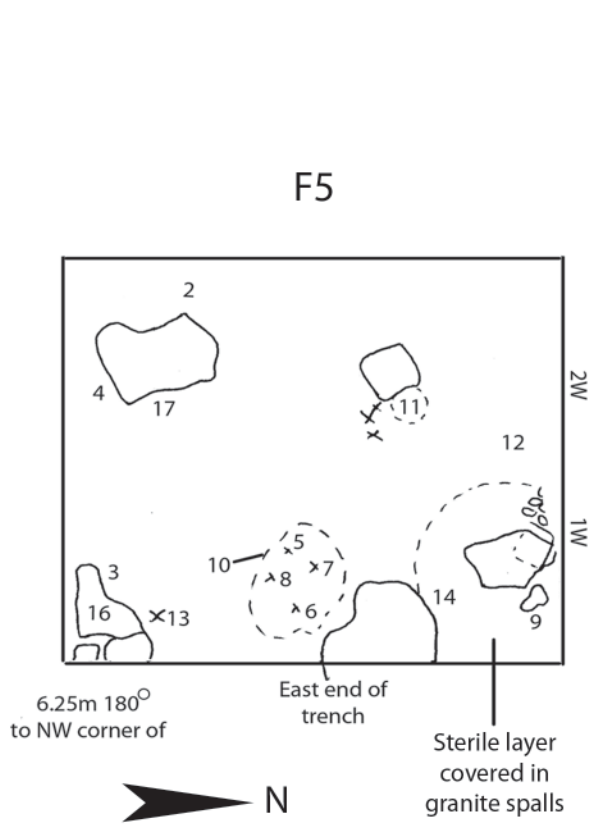
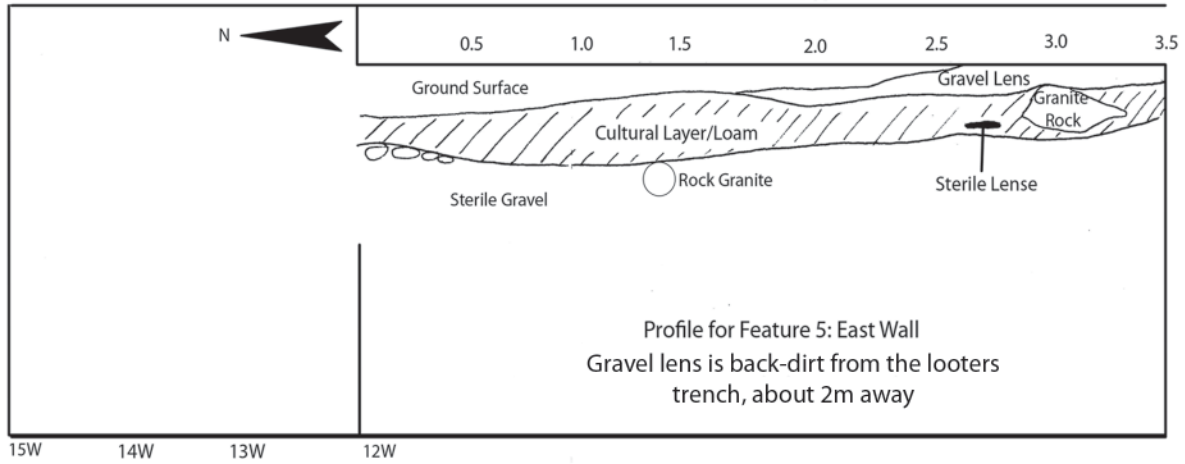
Tsagaan Chuulot
Deer Stone Site
Sagsai Sum
Asgat



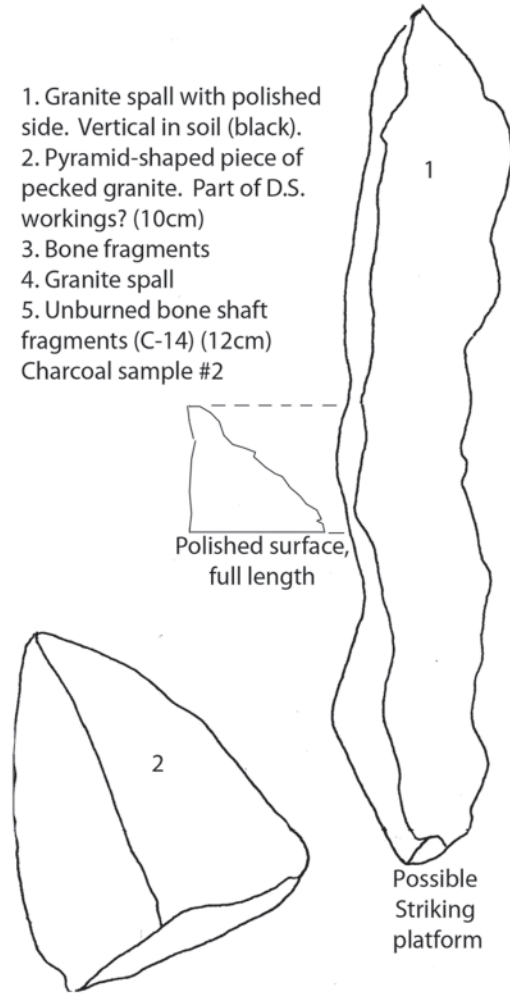
Avtiin Deer Stone Site
Renchinlumbe Sum
Hovsgol Aimag
12 June 2007



Avtiin D.S. Site
12 June 2007



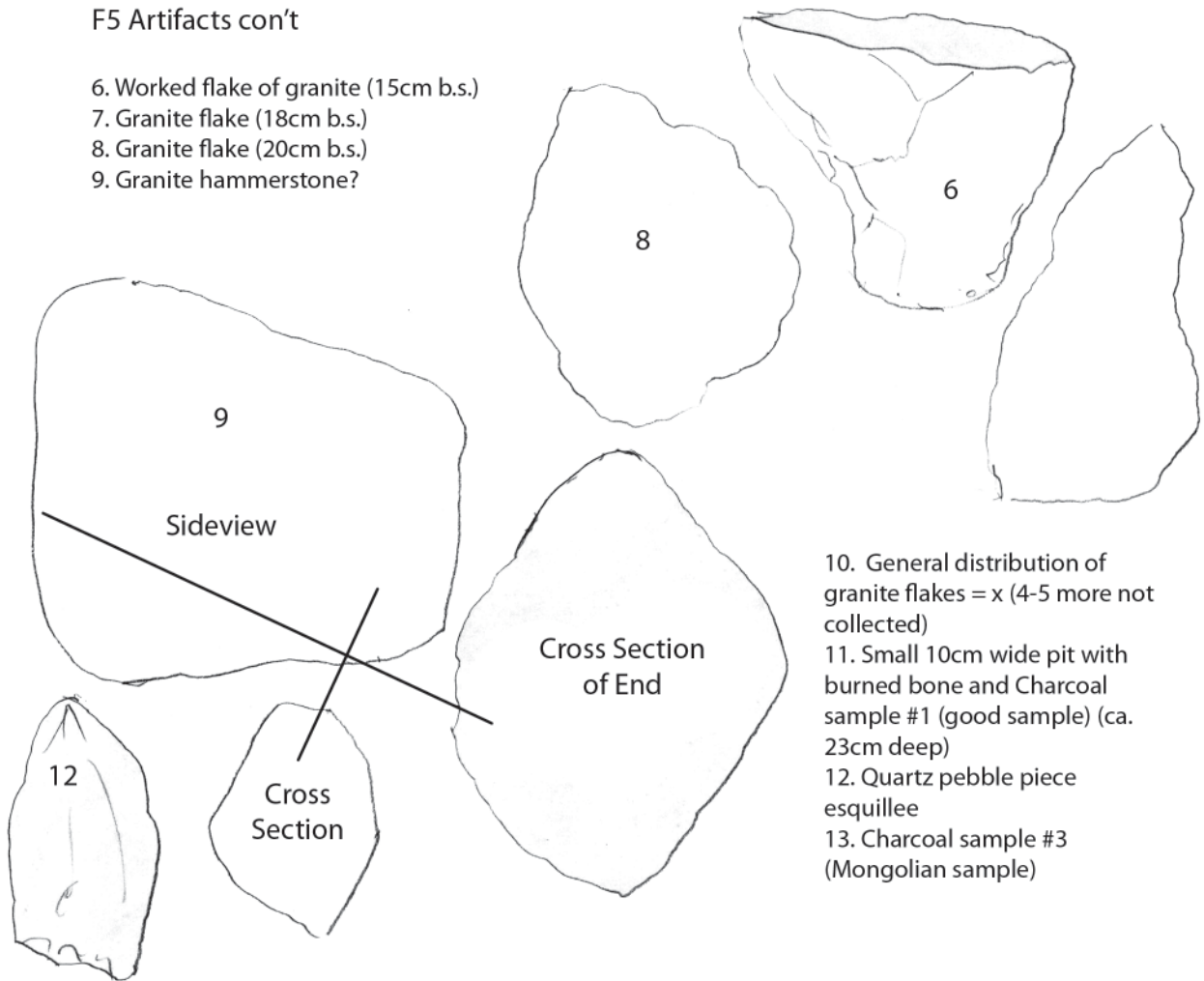
1. Granite spall with polished side. Vertical in soil (black).
2. Pyramid-shaped piece of pecked granite. Part of D.S. workings? (10cm)
3. Bone fragments
4. Granite spall
5. Unburned bone shaft fragments (C-14) (12cm)
- Charcoal sample #2



Avtiin D.S. Site
12 June 2007

F5 Artifacts con't

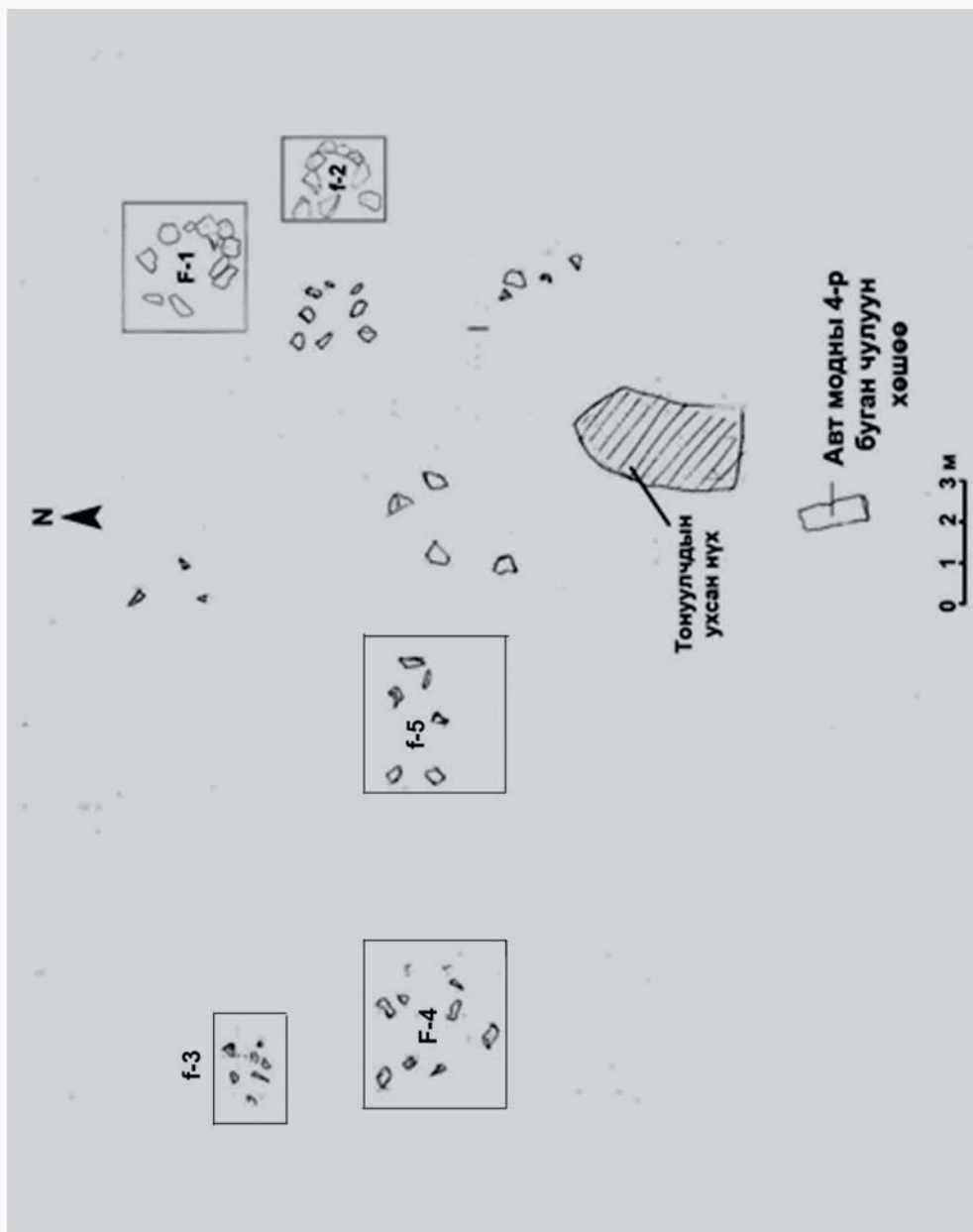
- 6. Worked flake of granite (15cm b.s.)
- 7. Granite flake (18cm b.s.)
- 8. Granite flake (20cm b.s.)
- 9. Granite hammerstone?



- 10. General distribution of granite flakes = x (4-5 more not collected)
- 11. Small 10cm wide pit with burned bone and Charcoal sample #1 (good sample) (ca. 23cm deep)
- 12. Quartz pebble piece esquillee
- 13. Charcoal sample #3 (Mongolian sample)

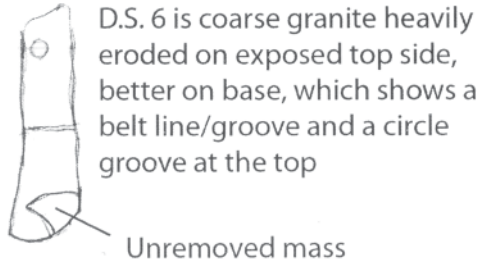
- 14. Charcoal sample #2 (Mat Sagi)
- 15. Charcoal sample #4 (Christie)
- 16. Charcoal sample #5 Under large rock (20cm) (Bill Stewart)
- 17. Charcoal sample #6 Associated with burned bone (18cm b.s.) (unknown location)

Many granite flakes and spalls present at base of cultured level in east side and NE corner - worked pieces from deer stone pre-shaping the large stones in the square were granite and showed signs of working - deer stone blanks shaped here. No obvious hammerstones except possibly #9.

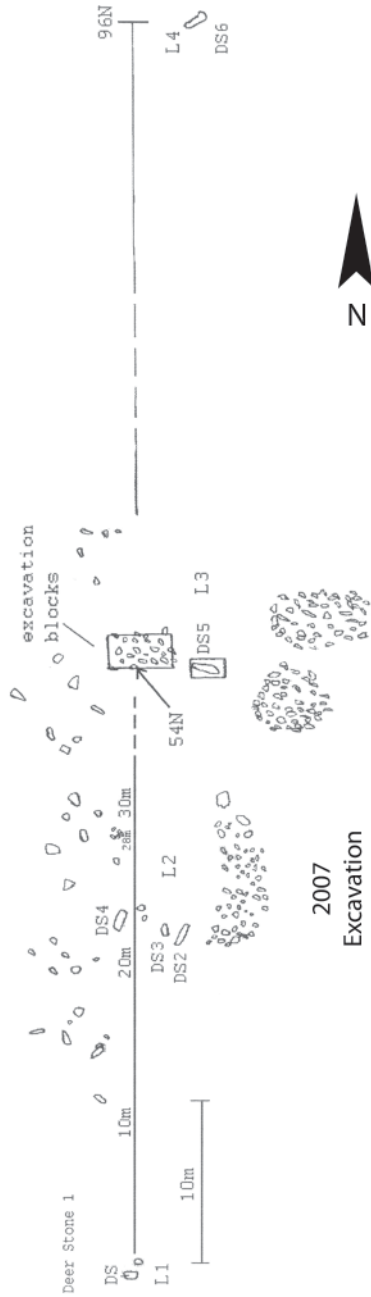


Avtiin/ AVT MOD DS SITE
Bayarsaikhan's Map

Hort Azuur
19 June 2006
Mapped by Tsomoo
and Adiyabold Namkhai



Hort Azuur DS Site
Map by Tsomoo, Adiyabold
19 June 2006

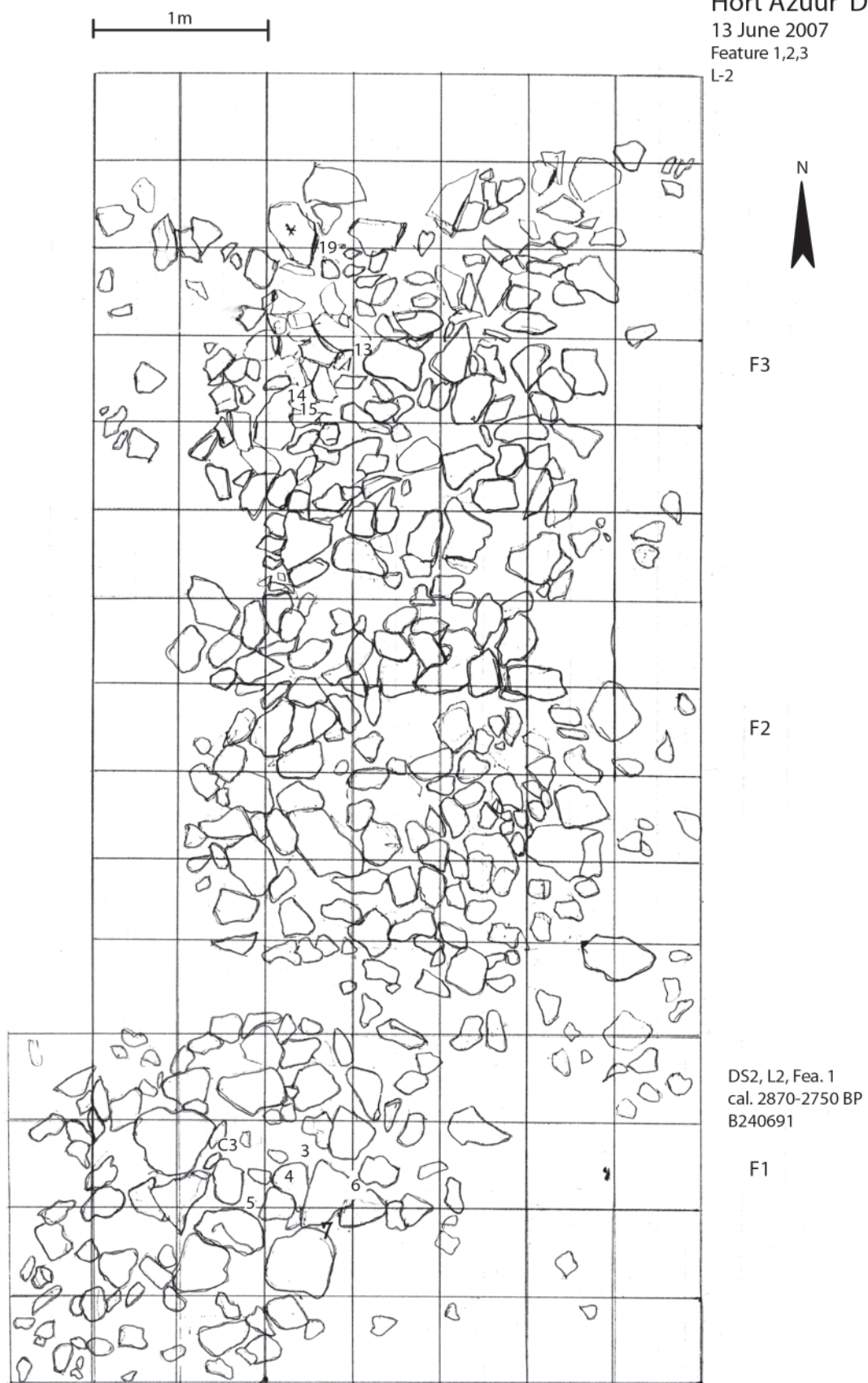


Hort Azuur DS2

13 June 2007

Feature 1,2,3

L-2



Hort Azuur
13 June 2007

Feature 3 (Northernmost Ring in Excavation Block)

1. Black chert flake (bottom of loam on gravel)
2. Brown chert flake between surface rocks (8cm)
- C1. Charcoal sample (East wall)
- C2. Charcoal sample (Center in fill)
8. Tan chert? Flake scraper (21cm below surface just inside ring in coarse gravel)
10. Chalcedony flake in brown fill
11. Black chert flake in brown fill
12. Black chert flake in brown fill
- C4. Charcoal in upper brown soil (5cm b.s.)
- C5. Charcoal in tan lower soil (15cm b.s.)
- C6. Charcoal inside ring west side (Sagi) (15cm b.s.)
16. Chalcedony flake in lower brown soil (10cm biface thinning flake)
17. Chalcedony flake in lower brown soil (10cm microblade)
18. (dark chert flake in lower brown soil (10cm biface thinning flake)



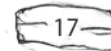
Feature 1 (Southern Ring)

3. Black chert flake from center (East inside ring)
4. Grey chert microblade mid-section (20cm west of east side inside ring)
5. Grey chert flake in ring fill of south side of ring
6. Dark chert biface base (21cm below surface)
7. Dark chert flake (15cm below surface)
9. C3 (west side of ring just inside the ring)



Feature 2

13. Chert flake in brown sand (15cm b.s.)
14. Chert flake in brown sand (15cm b.s.)
15. Chert flake in brown sand (15cm b.s.)
19. Dark chert flake (10cm b.s.)
20. Chalcedony flake in lower brown soil (15cm b.s.)
21. Dark chert flake on top of gravel layer lower brown soil (15cm b.s.)

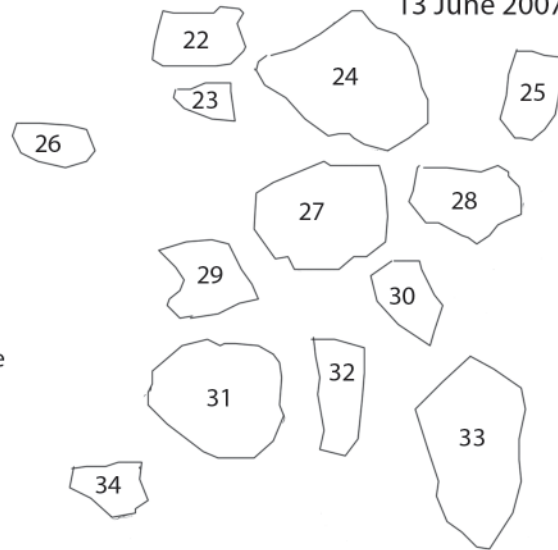


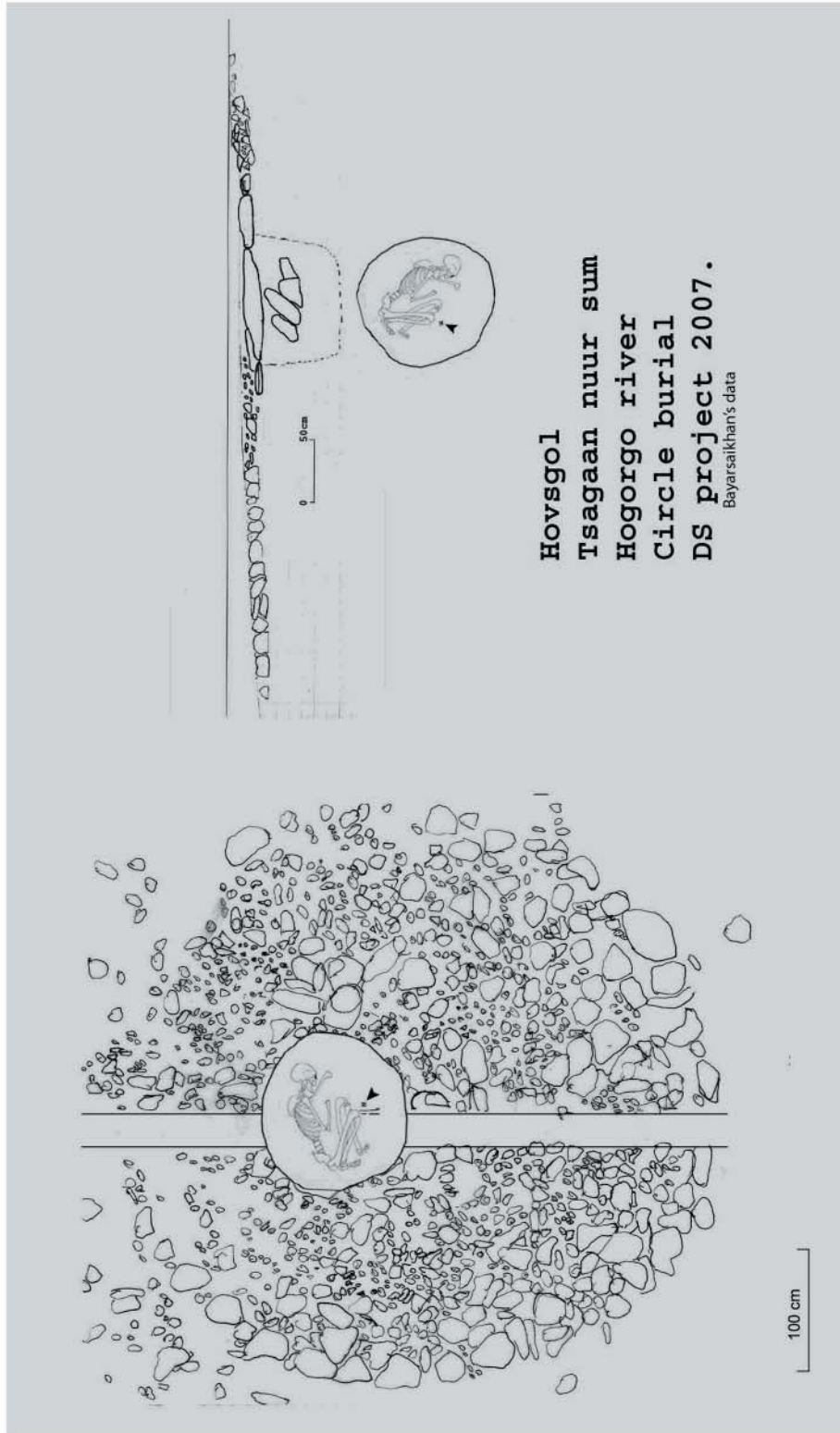
F2 (At edge of F3)

22. Dark chert found on top of gravel layer (15cm b.s.)
23. Dark chert found on top of gravel layer (15cm b.s.)
24. Dark chert found on top of gravel layer (15cm b.s.)
25. Light chalcedony on top of gravel layer (15cm b.s.)
26. Dark chert found on top of gravel layer
27. Light chalcedony on top of gravel layer (15cm b.s.)
28. Light chalcedony on top of gravel layer (15cm b.s.)
29. Light chalcedony on top of gravel layer (15cm b.s.)
30. Light chalcedony on top of gravel layer (15cm b.s.)
31. Light chalcedony on top of gravel layer (15cm b.s.)
32. Microblade of light chalcedony found same as above
33. Light chalcedony flake found same as above
34. Dark chert flake found same as above

(High concentration of chert and chalcedony flakes - kept separately in a bag.)

Hort Azuur
13 June 2007





human tooth
cal. 3830-3620 BP
B240687

Mongolia Deer Stone Project: Field Report 2007

Datum at West end of Balk
 Chert flake - •
 Slate - X

True North

Khogorgo Gol-3
 10 June 2007

320° M

-15 grd.
 -31 exc.

Stage 1: Found while cleaning the turf to upper rocks

1. Pottery rim sherd with grooved indentations on outside edge of rim (10cm below ground surface on rock pavement)



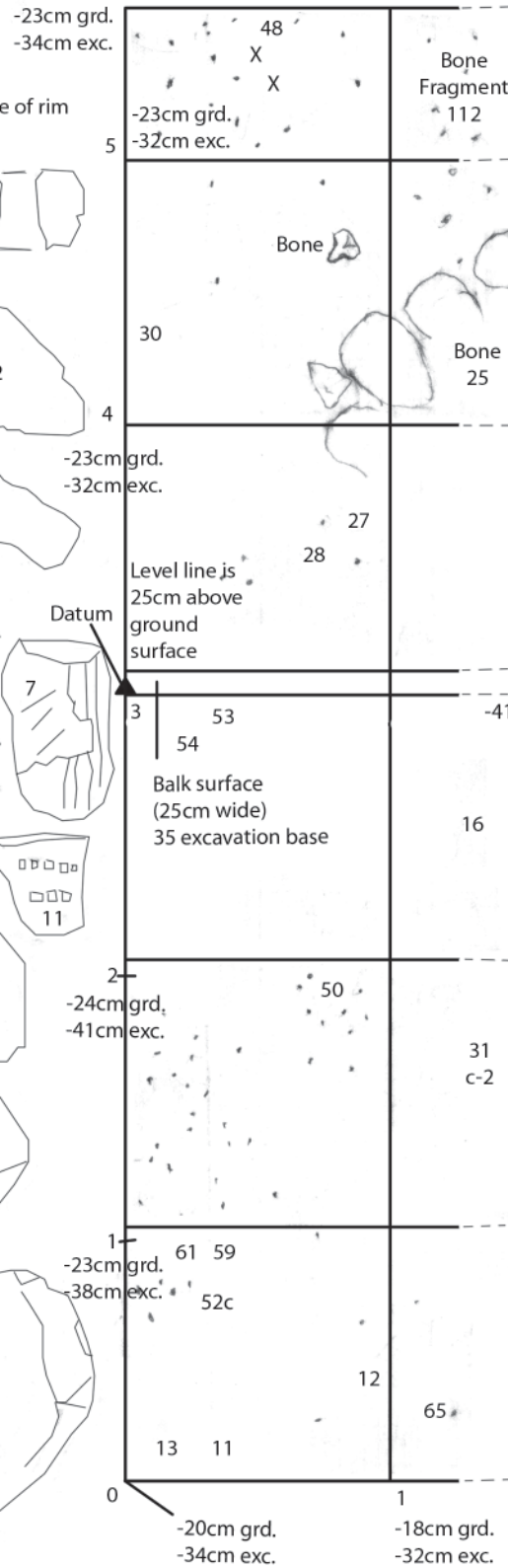
- 2. Body sherd probably from same vessel (10cm b.s.)
- 3. Body sherd probably from same vessel (10cm b.s.)
- 4. Core preparation flake (8cm b.s.)



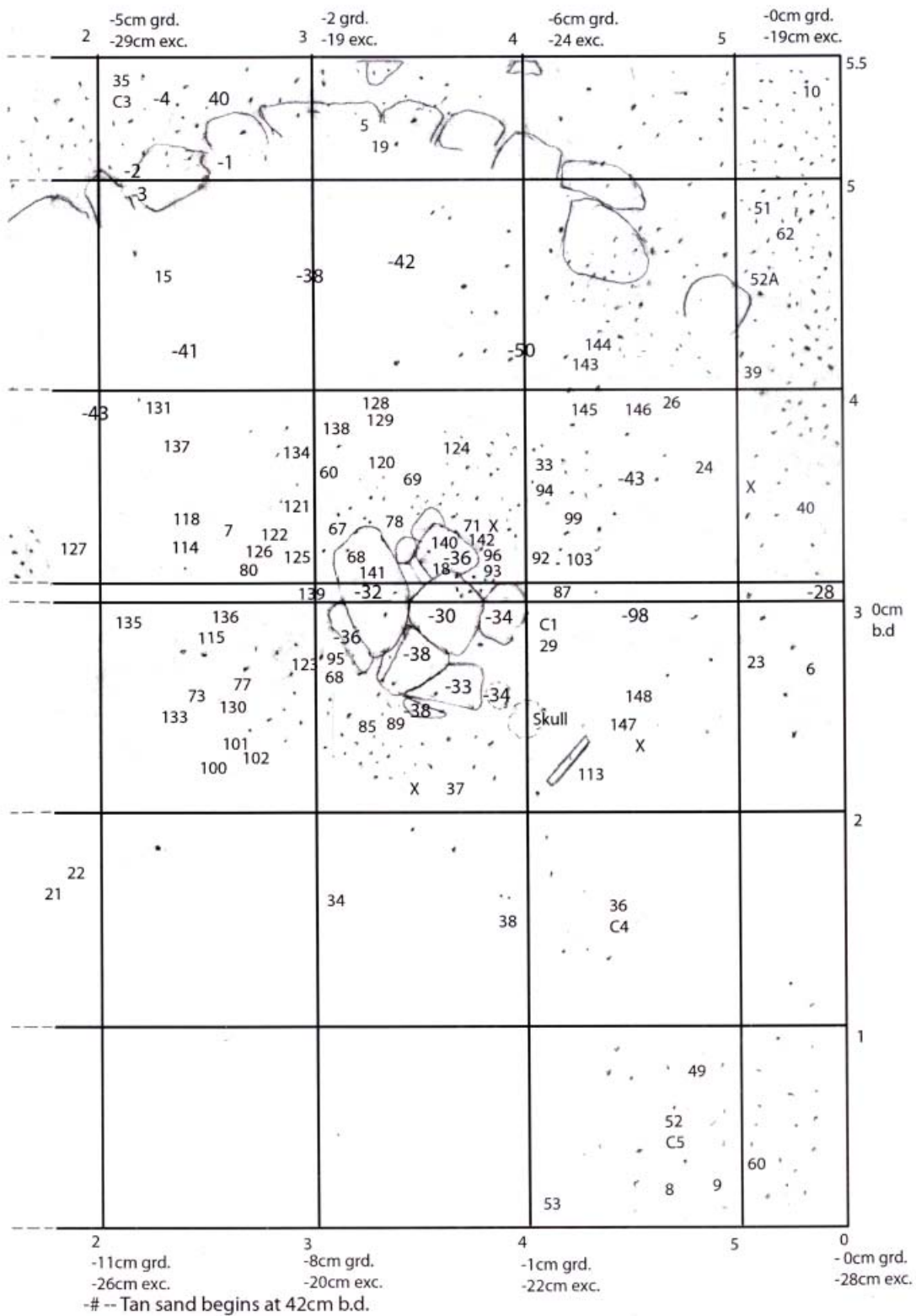
- 5. Microblade midsection, worked (10cm)
- 6. Microblade midsection (12cm)
- 7. Microblade core (10cm)
- 8. Microblade distal end (10cm)
- 9. Biface /scraper (10cm)
- 10. Microblade fragment (10cm)
- 11. Ceramic fragment with stamped decoration (Bronze Age type) (10cm)
- 12. Microblade fragment (10cm)
- 13. Core flake

Stage 2:
 Found in brown soil over cobbles

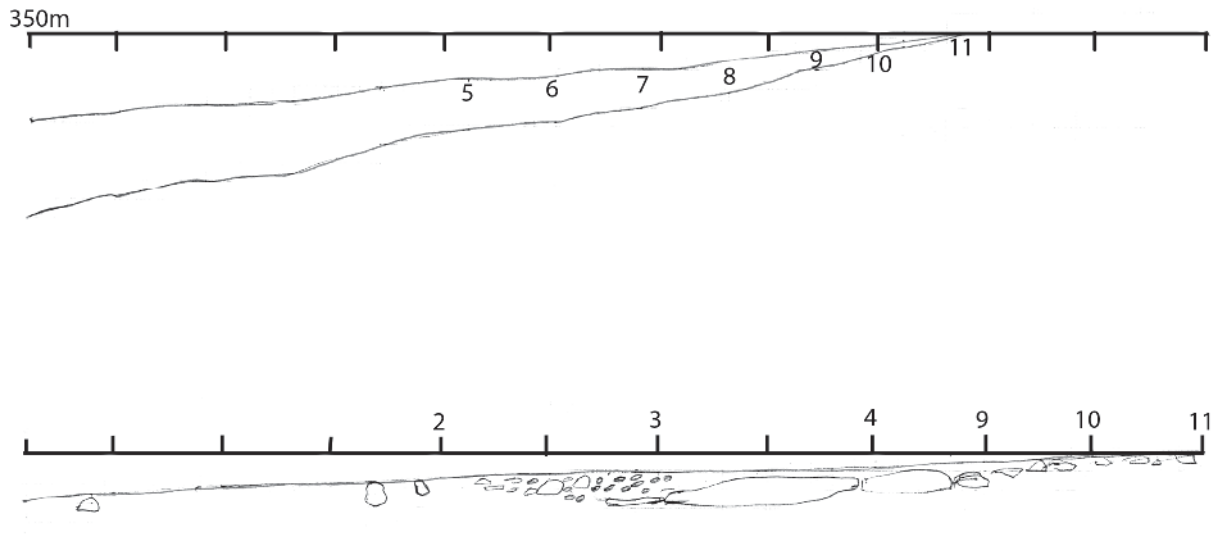
- 14. Large microblade (10cm)
- 15. Chert shaft scraper
- 16. Chert scraper
- 17. Core scraper
- 18. Pebble scraper
- 19. 12X8X8 chert, unworked



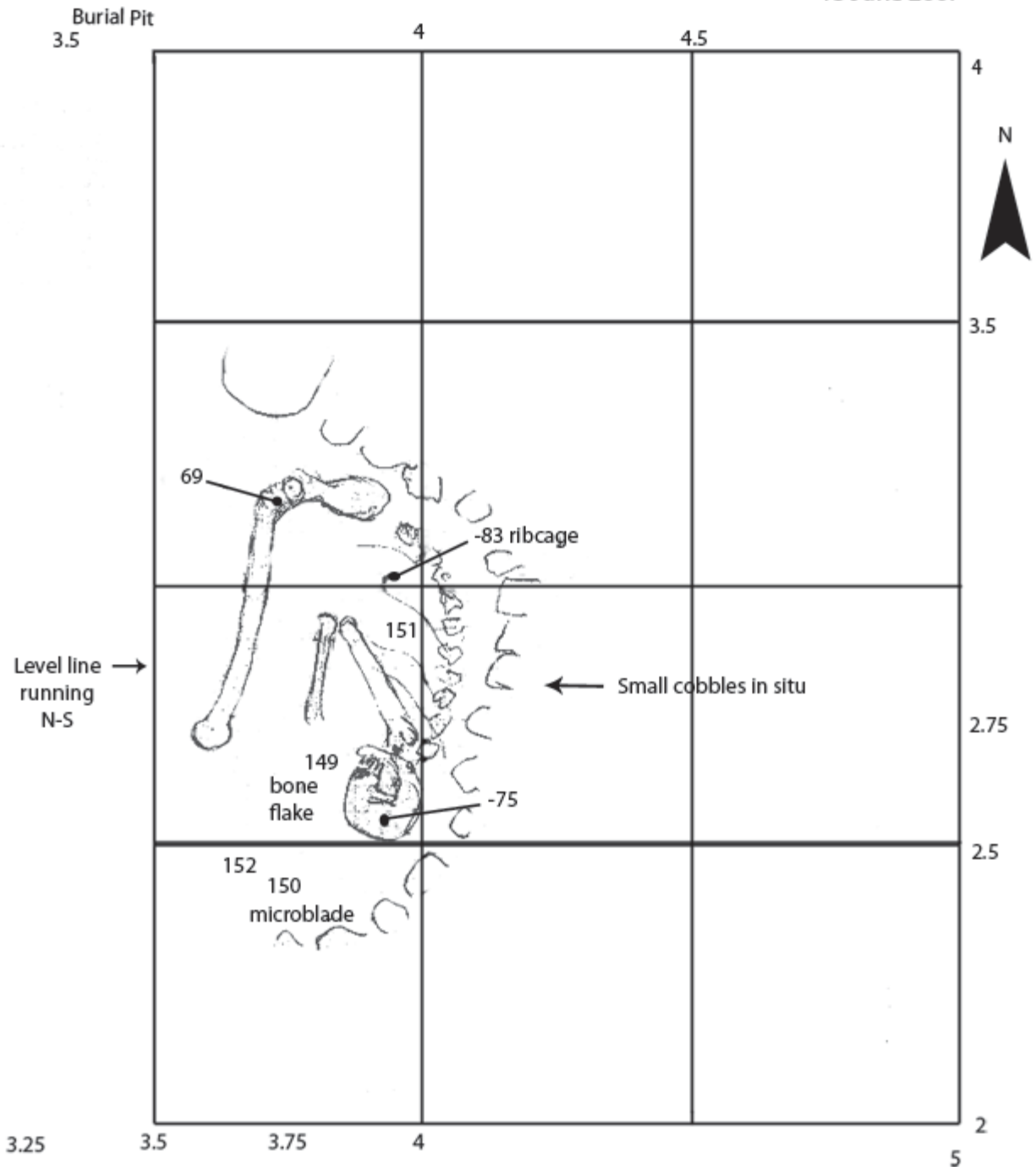
Khogorgo Gol-3
10 June 2007



Khogorgo Gol-3
East-West Profile



Khogorgo Gol-3
15 June 2007

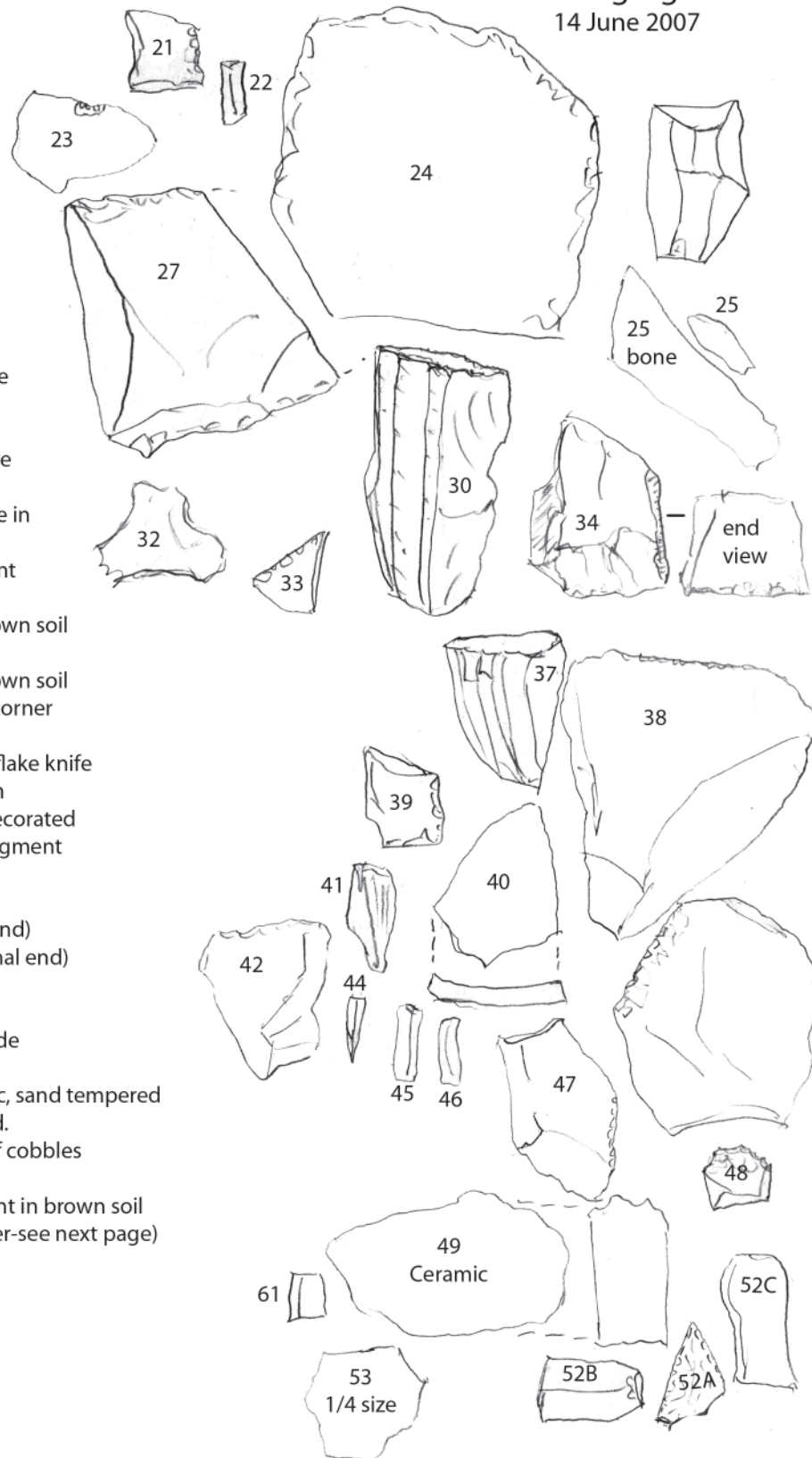


Body lying on left side, tightly flexed, arms flexed in front of chest, knees up against stomach, lower legs tightly flexed and right leg with slab rock on top of it. Several artifacts, chert, and bone flake directly associated with the body, Facing west, with head to south, and hips to the north. Pit is excavated through cobble level. Only large enough for the burial bundle.

Khogorgo Gol-3

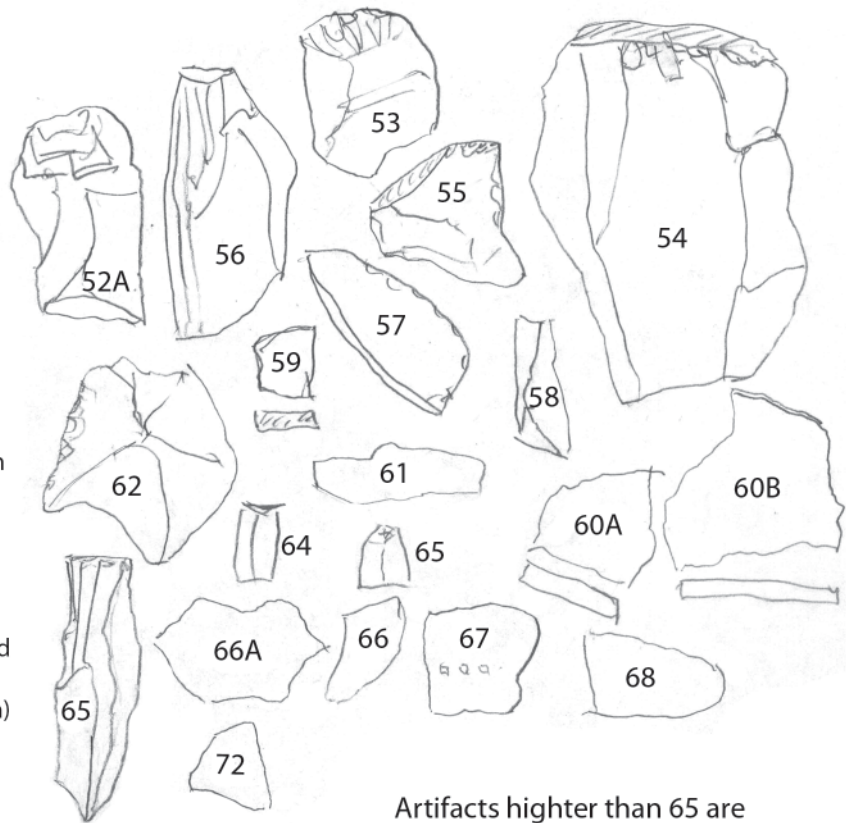
14 June 2007

- #14. Found above cobbles
- 21. Chert flake scraper
- 22. Chert microblade
- 23. Flake scraper
- 24. Slate worked piece
- 25. Bone flakes (2)
- 26. Microblade
- 27. Chert biface fragment
- 28. Large blade fragment
- 29. C-1 charcoal sample above cobble pavement
- 30. Microblade core
- 31. Charcoal sample C-2 above pavement
- 32. Large mammal distal bone in brown soil (12cm b.s.)
- 33. Chert biface edge fragment
- 34. Chert core fragment
- 35. Charcoal sample C3 in brown soil (15cm b.s.)
- 36. Charcoal sample C4 in brown soil SE pavement and outside in corner
- 37. Micorblade core
- 38. Biface preform fragment/flake knife
- 39. Biface preform midsection
- 40. Ceramic body sherd, undecorated
- 41. Small micorblade core/fragment
- 42. Flake scraper
- 43. Quartz microblade
- 44. Chert microblade (distal end)
- 45. Chert microblade (proximal end)
- 46. Chert microblade
- 47. Flake scraper
- 48. Endscraper on a microblade (13cm in brown soil)
- 49. Thick red surfaced ceramic, sand tempered and poorly fired, undecorated.
- 50. 3 pieces of bone on top of cobbles
- 51. Microblade midsection
- 52. Charcoal outside pavement in brown soil
- 53. Slate flake (double number-see next page)
- 52A. Biface point
- 52B. Proximal microblade
- 52C. Proximal microblade



Khogorgo Gol-3
14 June 2007

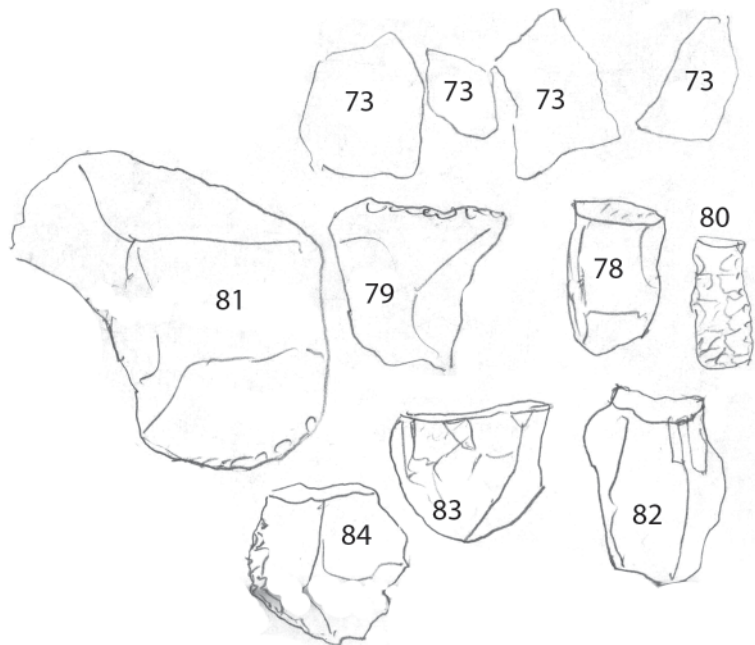
- 52D. Blade proximal fragment
- 53. Endscraper (double #)
- 54. Microblade core preform
- 55. Flake scraper
- 56. Microblade core
- 57. Biface preform
- 58. Microblade
- 59. Ceramics sherd (thin)
- 60. 2 ceramic sherds
- 61. Bone flake (18cm)
- 62. Core scraper
- 63. Microblade proximal midsection
- 64. Microblade midsection
- 65. Core fragment
- 66. Plain ceramics (2)
- 67. Ceramic with punctate design
- 68. Plain ceramic
- 69. Burned bone and charcoal found together (32cm b.d)
- 70. Burned bone (general collection)
- 71. Bone pin with expanded end (35cm b.d.)
- 72. Ceramic fragment



Artifacts higher than 65 are from fill below pavement

Level data: surface of ground (25cm; 35cm)

- 73. Ceramics (31cm b.d.)
- 74. Blade proximal end
- 75. Biface fragment
- 76. Microblade
- 77. Bone from (31cm b.d.) but in general bone condition is poor
- 78. Microblade core fragment
- 79. Utilized flake
- 80. Narrow biface point (32cm b.d)
- 81. Microblade core preform (no provenance)
- 82. Microblade core remnant (no provenance)
- 83. Microblade core remnant (no provenance)



Khogorgo Gol-3

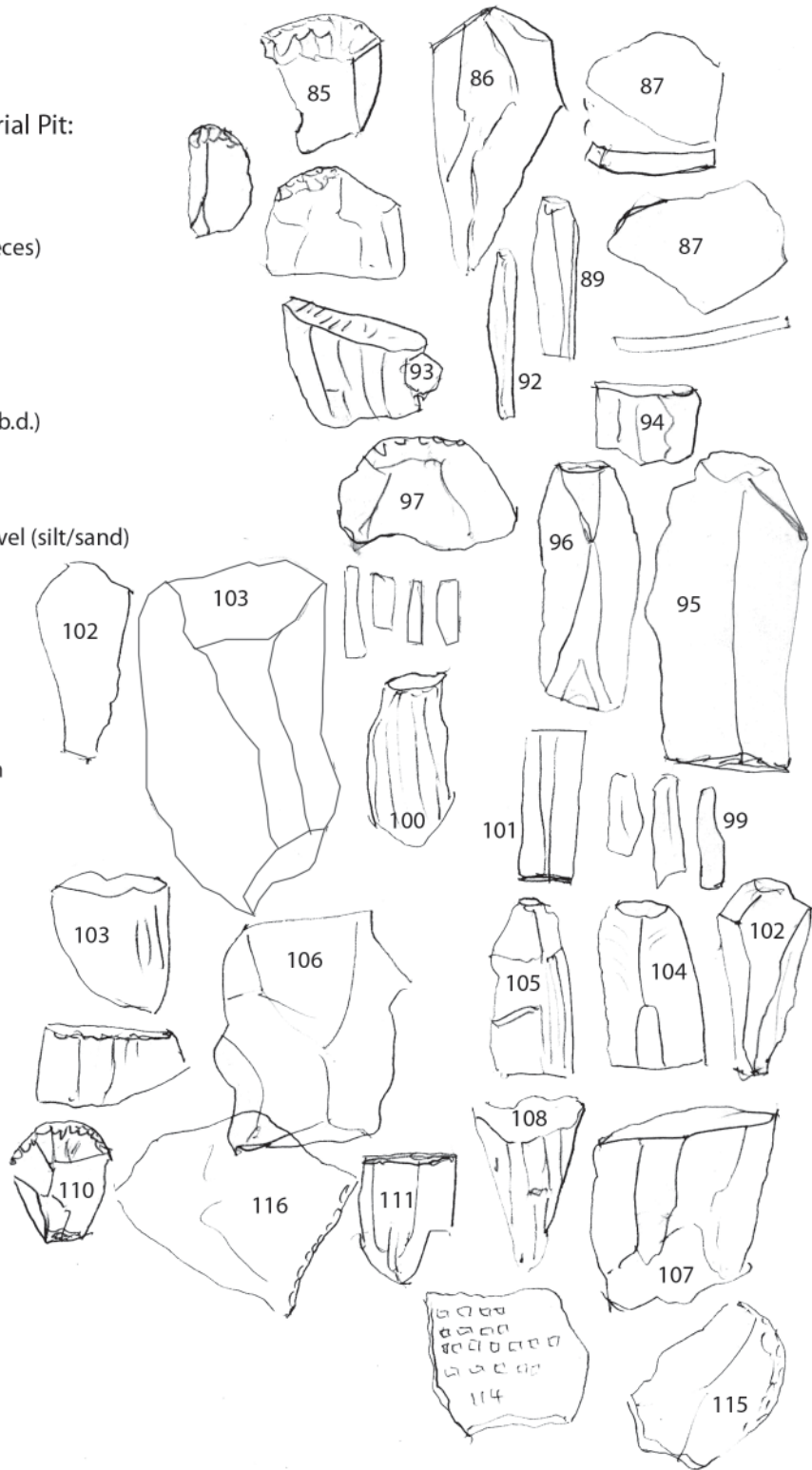
14 June 2007

Flakes and Artifacts from Burial Pit:

- 85. Scraper (35cm b.d)
- 86. Microblade preform/fragment
- 87. Thin ceramic (33cm b.d.) (2 pieces)
- 88. Bone (33cm b.d)
- 89. Microblade (37cm b.d.)
- 90. Endscraper (37cm b.d.)
- 91. Small enscraper (37cm b.d.)
- 92. Microblade
- 93. Microblade core tablet (38cm b.d.)
- 94. Microblade core fragment
- 95. Blade
- 96. Blade (36cm b.d.)
- 97. Endscraper from brown soil level (silt/sand)
- 99. 7 microblades
- 100. Small microblade core
- 101. Microblade midsection
- 102. Microblade midsection

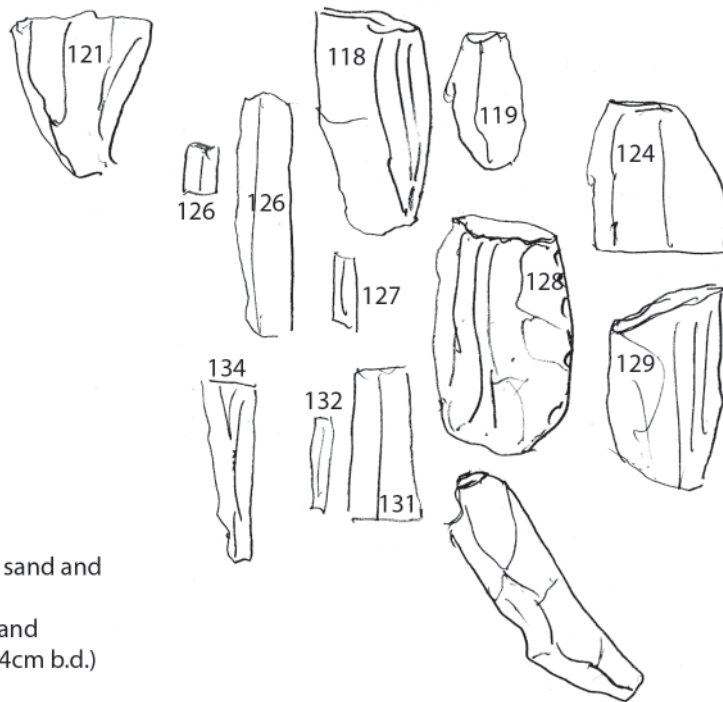
Had to stop plotting artifacts due to inability to keep track of finds - the following are without location provenance

- 103. Microblade
- 104. Core preparation blade
- 105. Core fragment
- 106. Core blank
- 107. Core blank
- 108. Core fragment
- 109. Core top fragment
- 110. Endscraper
- 111. Core top fragment
- 112. Bone fragments (15cm)
- 113. Horse(?) rib bone (51cm b.datum)
- 114. Dentate - stamped pottery (34cm b.d.)
- 115. Scrapers
- 116. Flake scraper



Khogorgo Gol-3
15 June 2007

- 117. Bone from balk
- 118. Core
- 119. Microblade
- 120. Bones (?)
- 121. Core platform
- 122. Bone fragments (37cm b.d.)
- 123. Bone fragments (epiphyses)
- 124. Microblade/core fragments
- 125. Bone fragments
- 126. 2 microblades
- 127. Microblade
- 128. Microblade core (50cm b.d.)
- 129. Microblade core (50cm b.d.)
- 130. Bone fragment
- 131. Microblade midsection
- 132. Tiny microblade
- 133. Bone fragment
- 134. Micorblade
- 135. Bone at 43cm b.d. in top of tan sand and interface just below
- 136. Tooth at 40cm base of brown sand
- 137. Bone at brown/tan interface (44cm b.d.)
- 138. Ridge flake



From Burial:

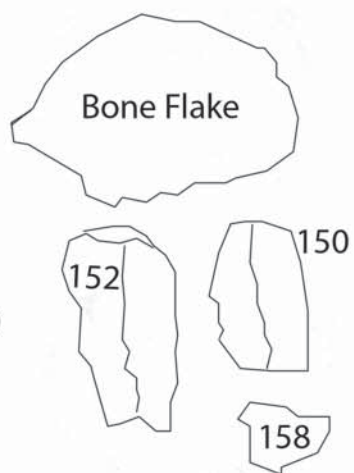
- 139. Microblade core (53cm b.d.)
- 140. Bone (64cm b.d.)
- 141. Mineralized rock or concretion or pyrotechic product?
- 142. Long bone fragments with flat surface (no working marks).
From pit extension to NE of rock. Found human long bone NE of pit rocks and extended excavation pit in this direction
- 143. Stamped pottery with scratches
- 144. Pottery with scratch mark (decoration?)
- 145. Ridge flake
- 146. Bifacial arrowhead
- 147. Microblade at junction of brown/tan soil
- 148. Micorblade core prep. flake in tan soil



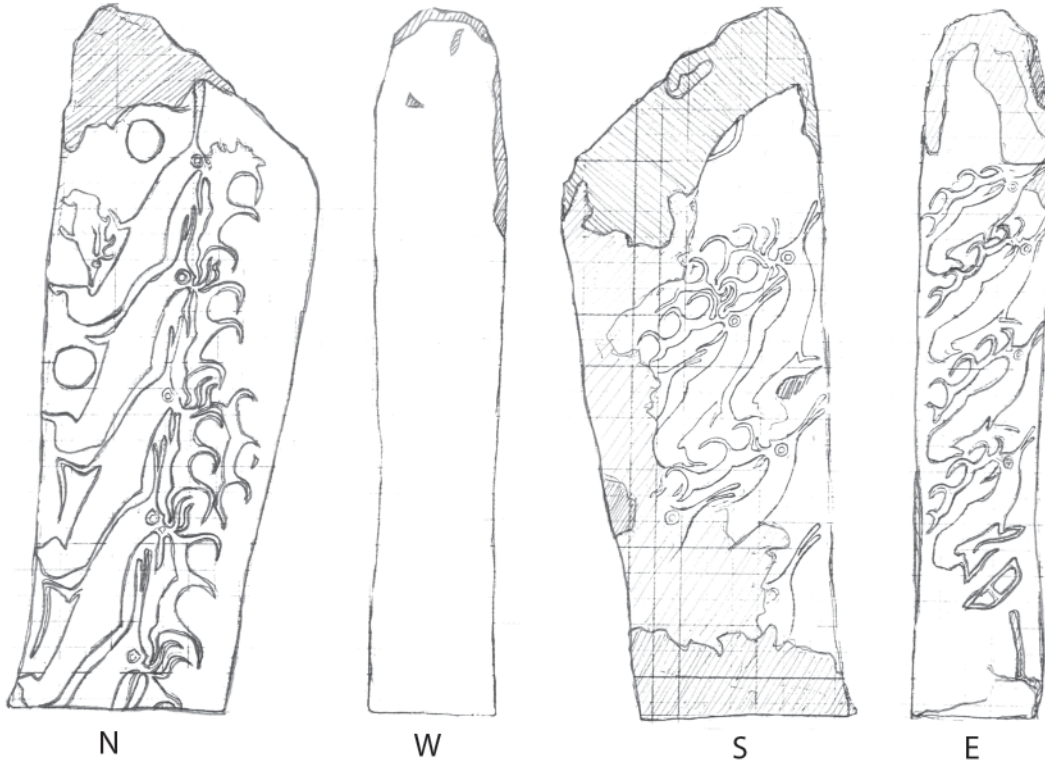
Khogorgo Gol-3
15 June 2007

Found with the Burial:

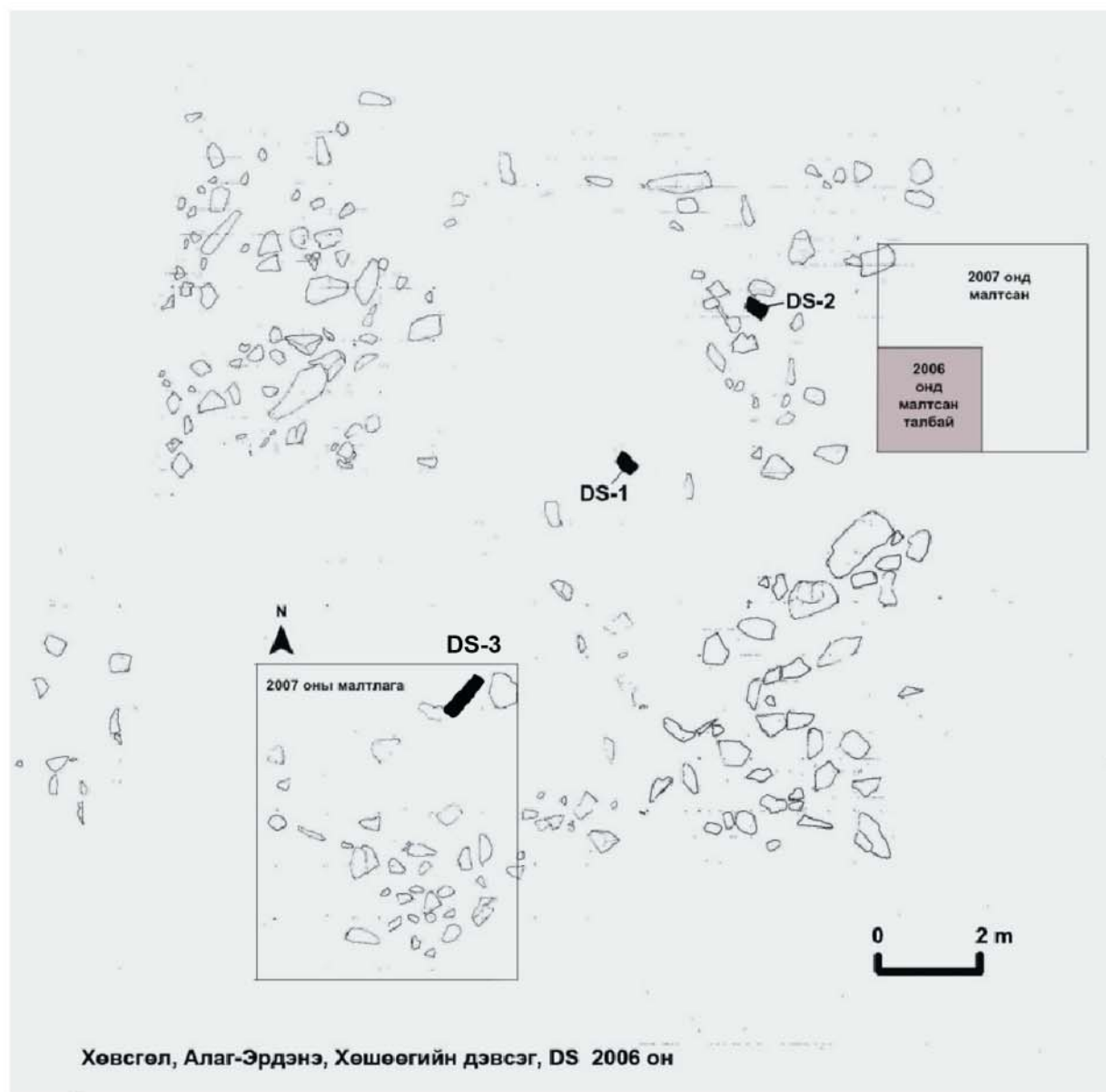
- 149. Bone flake (86cm b.d.)
- 150. Microblade (87cm)
- 151. Chert flake in ribcage (83cm)
- 152. Microblade ridge flake (86cm)



Khushuutiin Devseg
Deer Stone 1



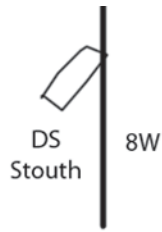
Art by Enkhbold



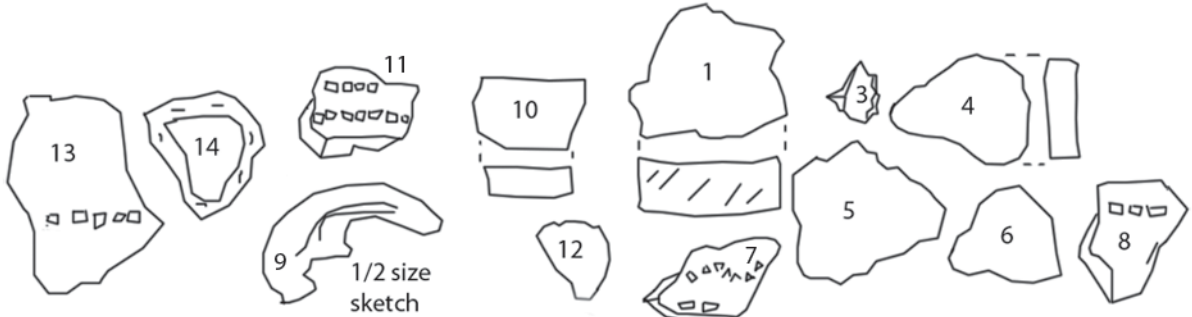
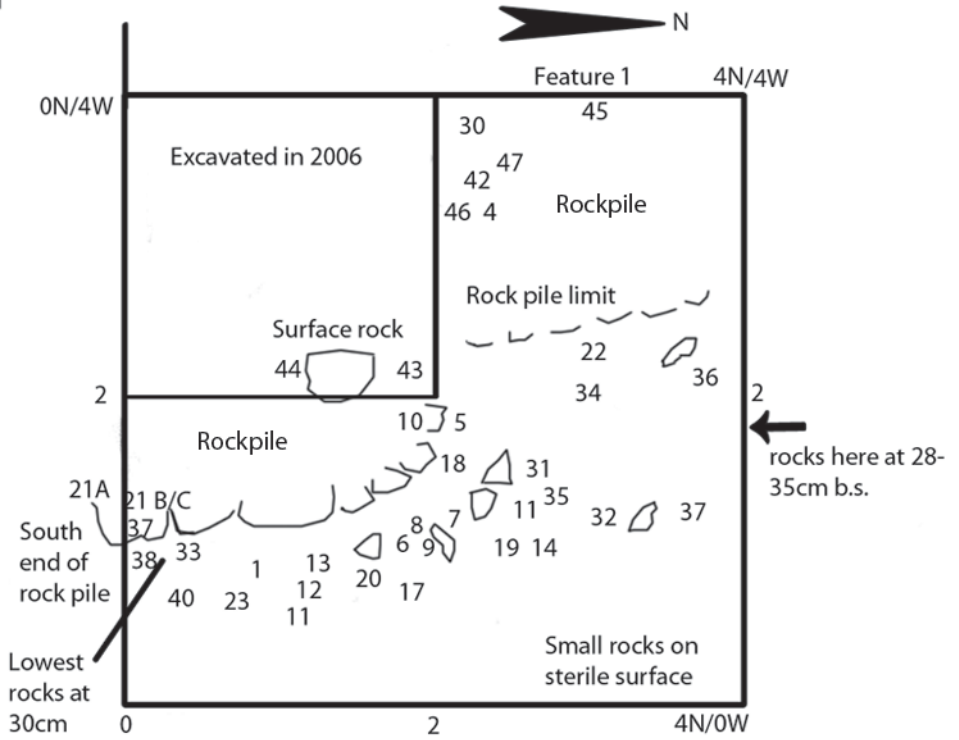
KHUSUUGIIN DEVSEG

Bayarsaikhan's data

Khushuugiin Devseg
 Feature 1
 19 June 2007



1. Red surface ceramic in surface soil
2. 2 pieces of ceramic in test pit (20cm b.s.)
3. Work chert fragment (18cm b.s.)
4. Ceramic fragment (20cm b.s.)
5. Ceramic fragment (20cm b.s.)
6. Ceramic fragment (18cm b.s.)
7. Ceramic fragment (18cm b.s.)
8. Ceramic fragment (20cm b.s.)
9. Bone fragment (25cm b.s. Interface of brown and tans sand)
10. Ceramic rim sherd (28cm b.s. Flat-topped rim)
11. Ceramic sherd with punctate decor (25cm b.s.)
12. Ceramic sherd (26cm b.s.)
13. Ceramic body sherd, decorated (26cm in hard brown soil)
14. Ceramic sherd

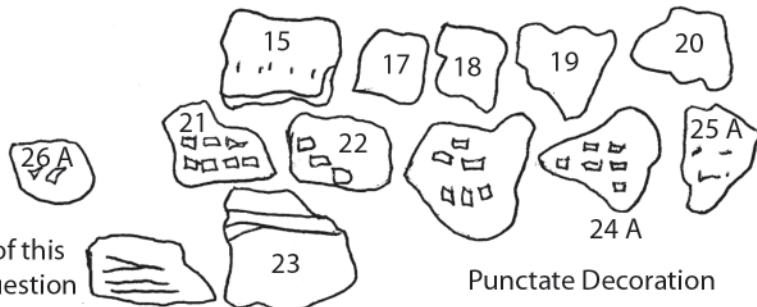
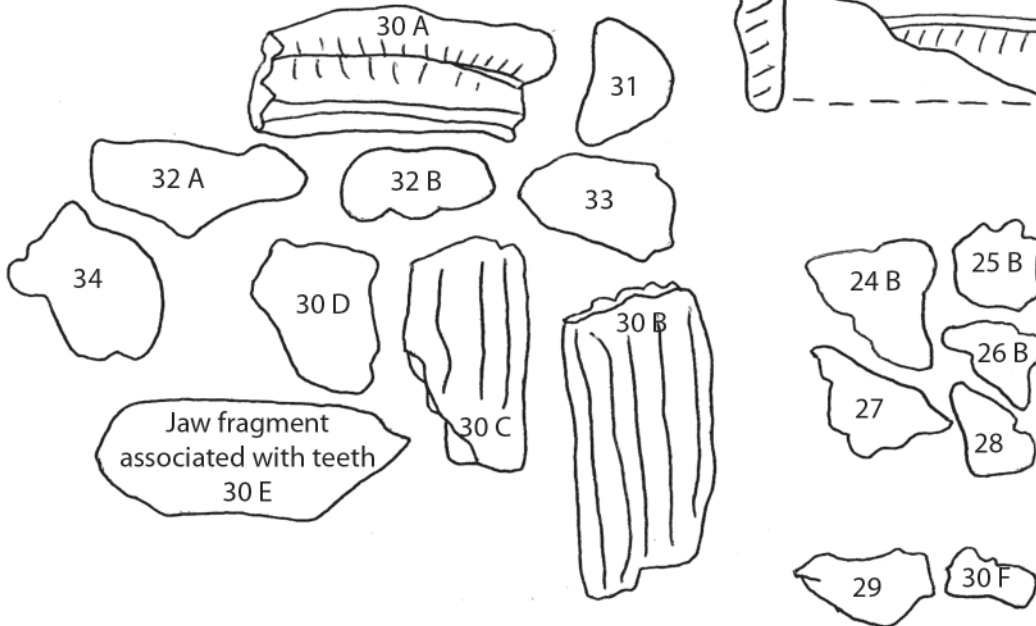
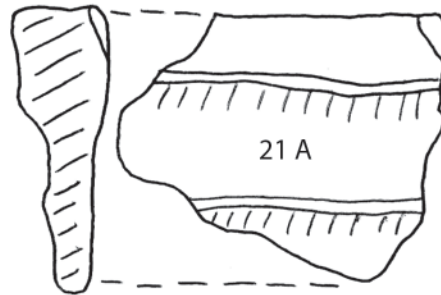
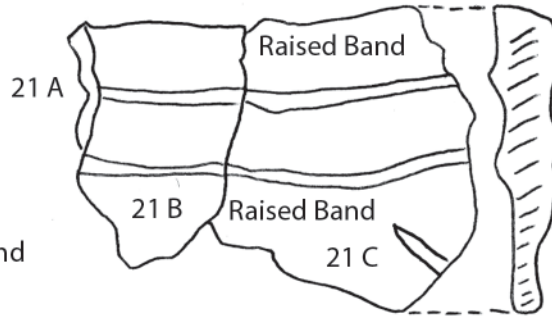


Khushuugin Devseg

Feature 1

19 June 2007

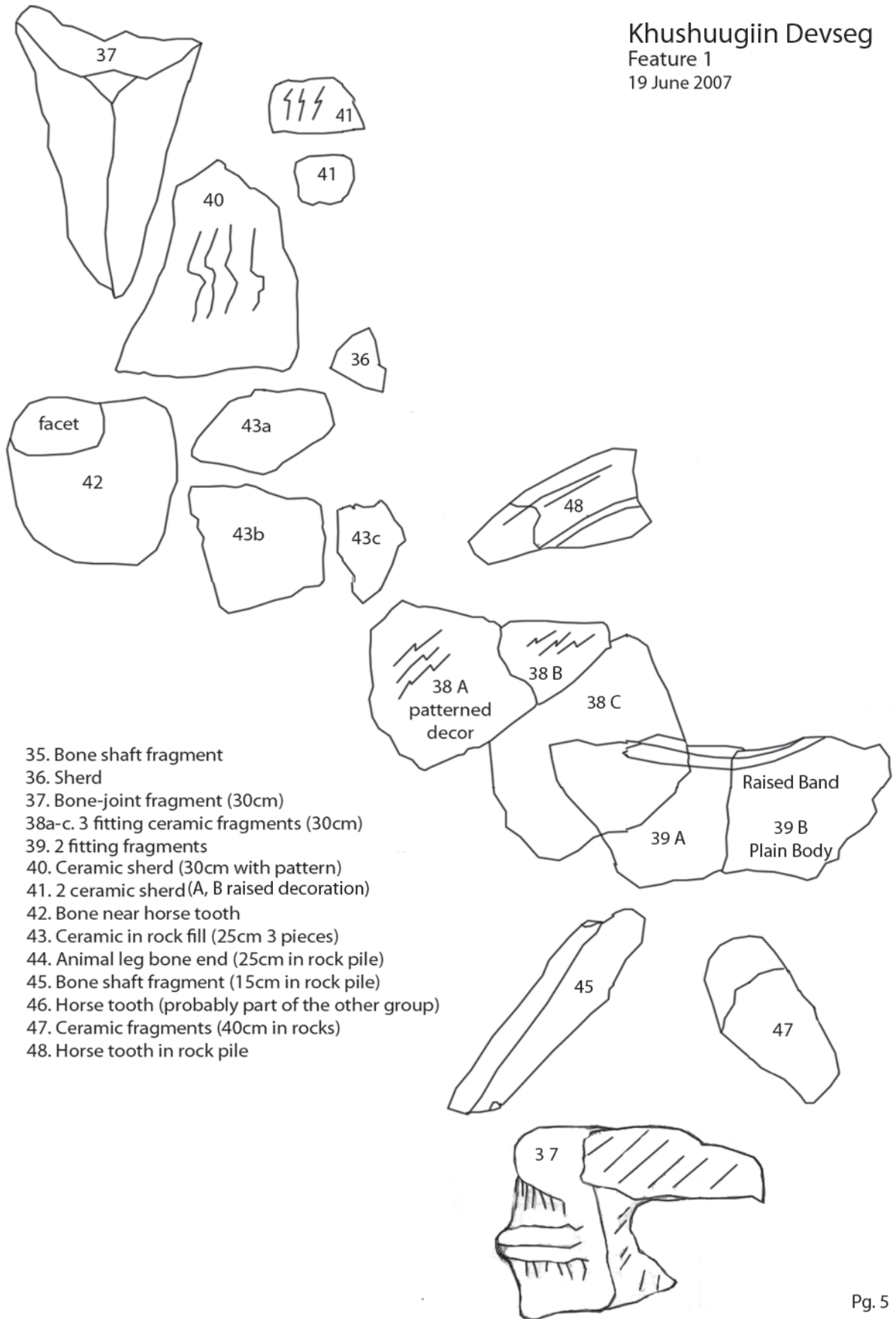
- 15. Ceramic body shert punctate decor
- 16. Bone fragment (28cm b.s.)
- 17. Ceramic fragment body shert (30cm b.s.)
- 18-20. Ceramic fragments (28-30cm b.s.)
- 21A-C. Rim shards of large ceramic bowl
- 22. Ceramic fragment
- 23-29. Ceramic fragments from SW quadrant
- 30A-F. Horse teeth (30cm) Same horse as (found aligned upright as if in jaw which may have decomposed) recovered from excavation of feature 1 last year.
- 31. Ceramic sherd (30cm b.s.)
- 32A-B. 2 flat bone fragments (30cm)
- 33. Ceramic sherd
- 34. Ceramic sherd



The identity of this piece is in question

Punctate Decoration

Khushuugiin Devseg
 Feature 1
 19 June 2007

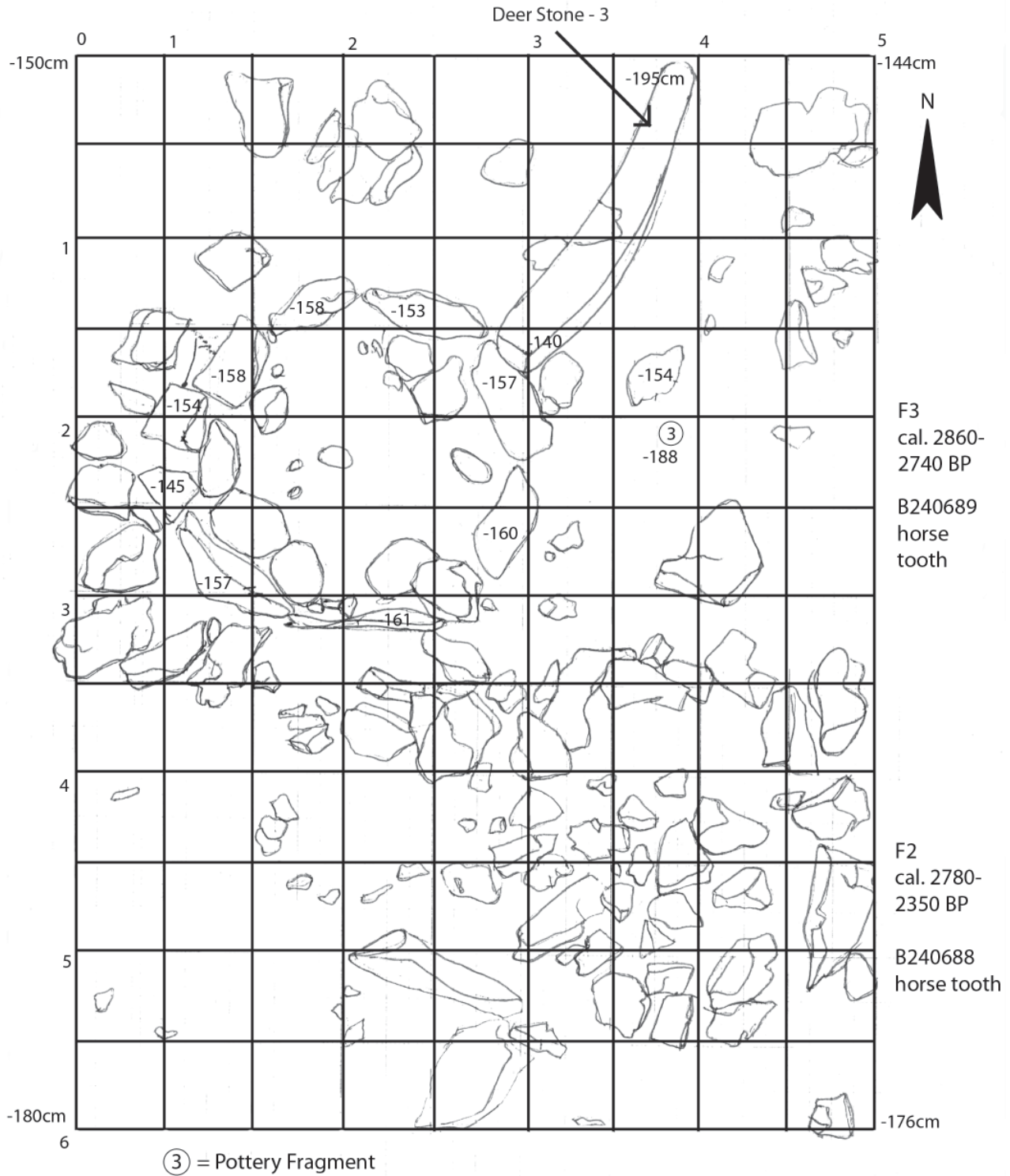


- 35. Bone shaft fragment
- 36. Sherd
- 37. Bone-joint fragment (30cm)
- 38a-c. 3 fitting ceramic fragments (30cm)
- 39. 2 fitting fragments
- 40. Ceramic sherd (30cm with pattern)
- 41. 2 ceramic sherd(A, B raised decoration)
- 42. Bone near horse tooth
- 43. Ceramic in rock fill (25cm 3 pieces)
- 44. Animal leg bone end (25cm in rock pile)
- 45. Bone shaft fragment (15cm in rock pile)
- 46. Horse tooth (probably part of the other group)
- 47. Ceramic fragments (40cm in rocks)
- 48. Horse tooth in rock pile

Khushuugiin Devseg

19-18 June 2007

Feature 2,3



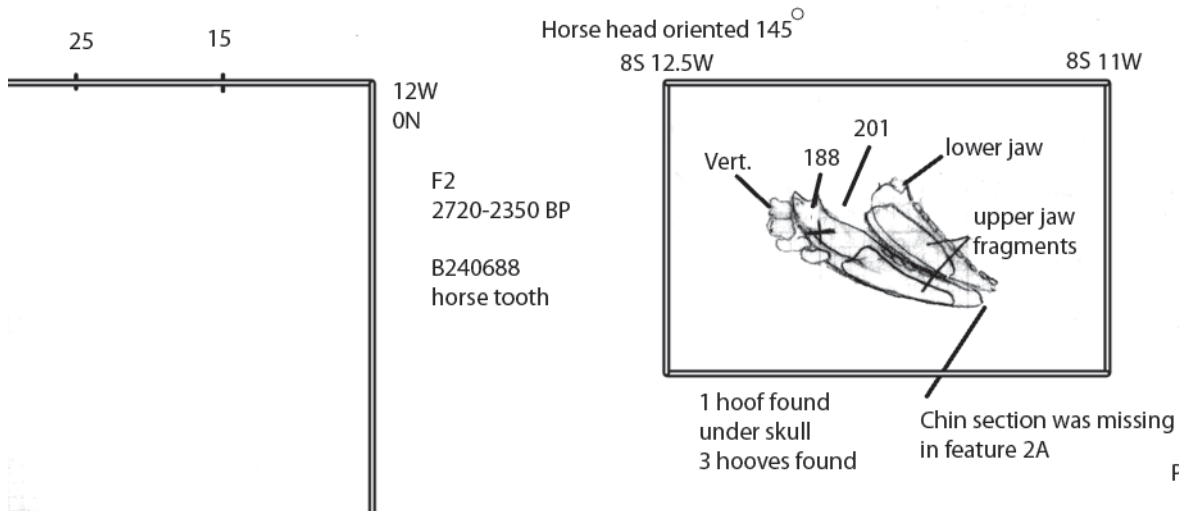
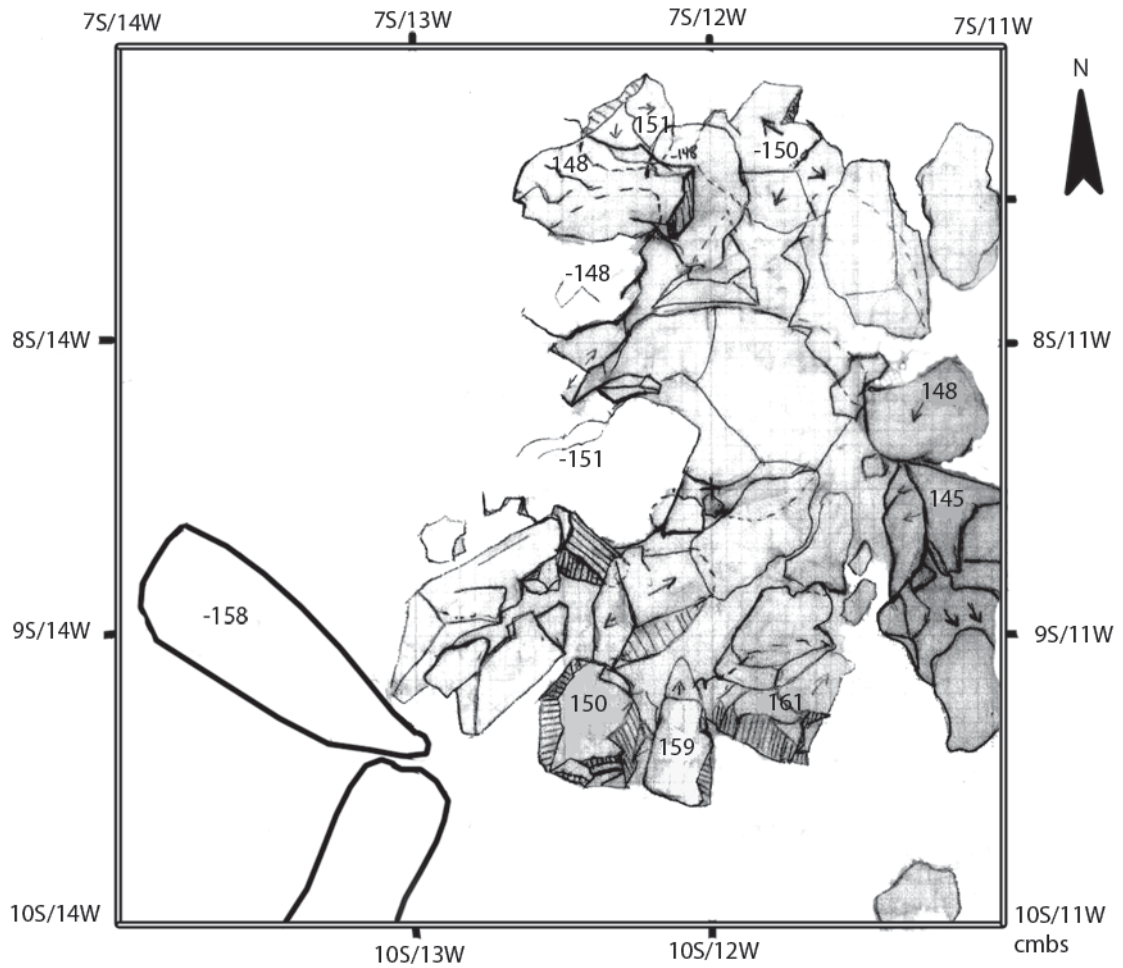
Khushuugiin Devseg

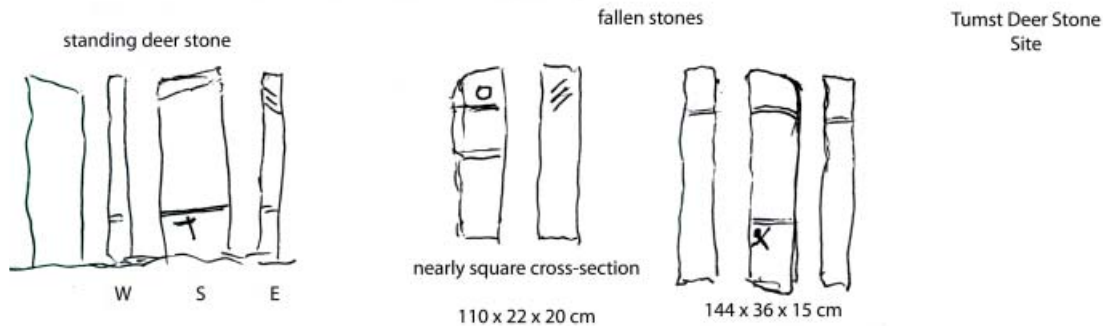
19 June 2007

Feature 2A Circle Mound

Second layer of rocks under surface layers of rocks

Map 2
Feature 2





Tumst Deer Stone Site

20 June 2007

GPS # 312 – 1819 m elev. N49°53.482'E 100°03.862

Located on a ridge on the east side of the valley east of the Muren-Horsgol road. When we visited the site the valley below had 10-12 gers/families in residence, so it was to be good pasture this time of year. We learned of the site from a herder who visited the Khushuutin Devseg site two days ago. The location is unusual in being in a high location and on a ridge not in a flat place, and the view also is restricted; there is a view of only a small section of the valley so few could see it from below, and from the hills above it would not stand out especially either. The site name is from a plant that has an onion-shaped bulb used to make flour.

The three stones are all made of rough hewn pink granite that is very hard and is not prone to natural erosion, but the stones are only minimally carved. One stands, its broad sides facing north and south, and is being eroded by fissures opening up at its top in the east-west direction angling down to west side.

Deer stone one (standing), with a slightly angled top, has a belt groove about 1/3 the way up from the bottom with a battle axe hanging from it. No circles are visible. The east narrow side has //. Two other granite stones are lying on the surface but appear to have been removed from depressions 2m west of the standing stone and another 8m south of the standing stone. Both have narrow belt grooves, and the larger stone (144 x 36 x 15 cm) has a necklace groove (no pits) and // on one narrow side. It is roughly prepared – though in good rectangular cross-section. The smaller fallen stone has a belt groove, a neck groove, and circle grooves on opposite sides of its largely square shaft. No obvious tools. 110 x 22 x 20 cm. 110 cm is full length.

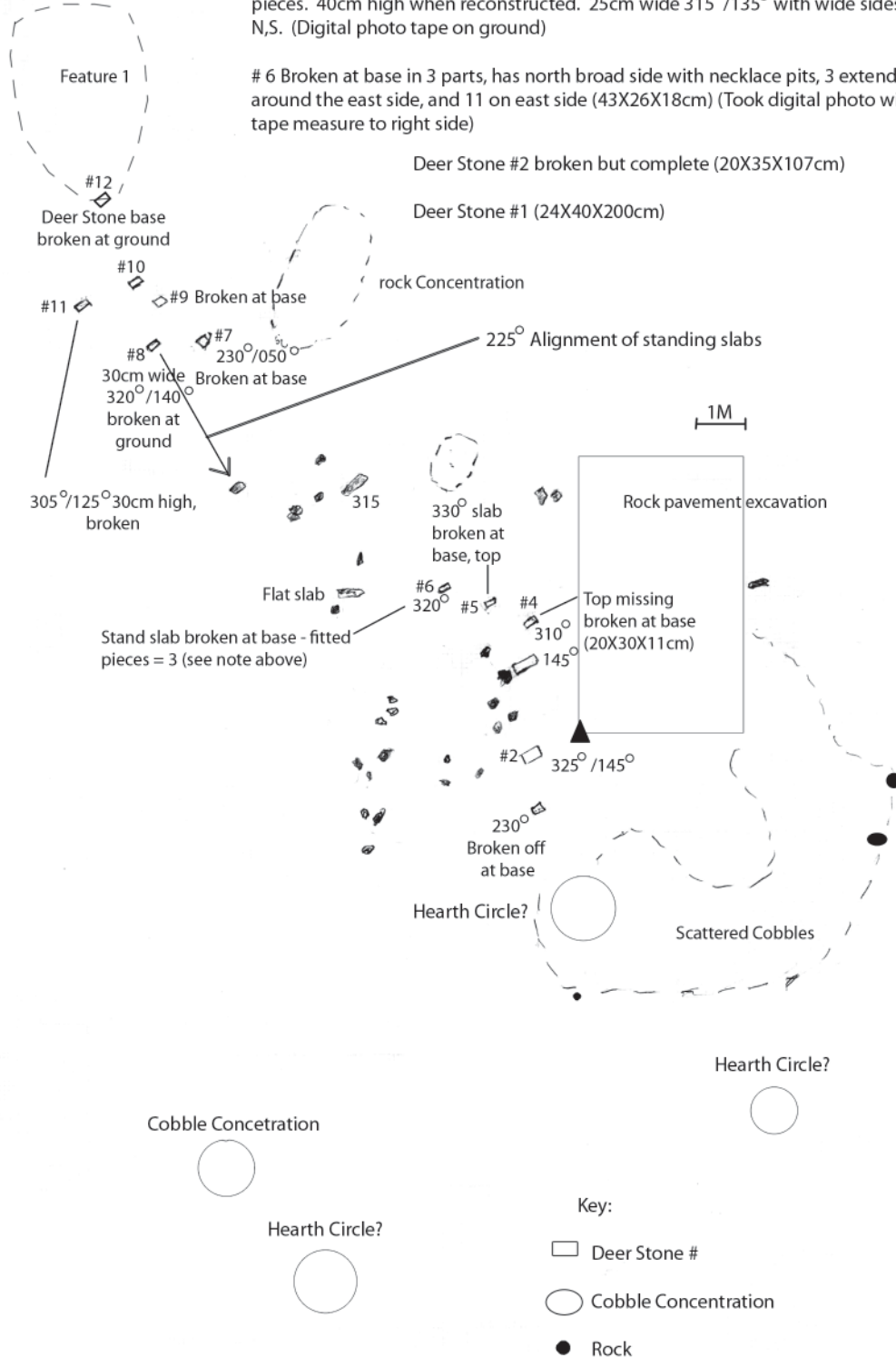
Khyadag D.S. Site (East Group)

22 June 2007

#12 190cm from #11 (Length? 20X20 thick), 170cm from #10 - excavated a bit below ground surface, found necklace pits on north side, and // on east side.

#10 Deer Stone with O on north side, broken halfway up, but fit together with 6 pieces. 40cm high when reconstructed. 25cm wide 315°/135° with wide sides on N,S. (Digital photo tape on ground)

#6 Broken at base in 3 parts, has north broad side with necklace pits, 3 extending around the east side, and 11 on east side (43X26X18cm) (Took digital photo with tape measure to right side)

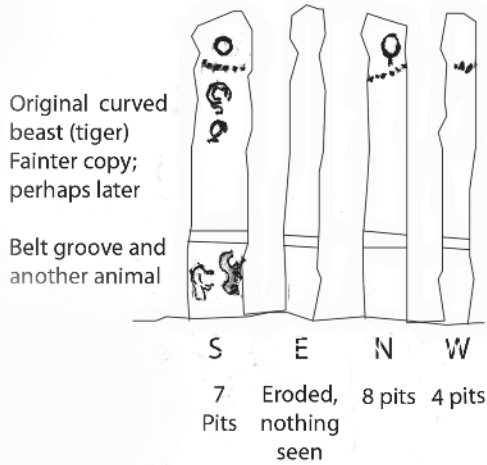


June 21, 2007

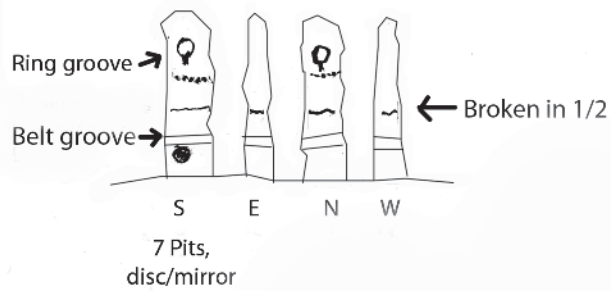
Khyadag Deer Stone Site
 Eastern Deer Stone Group
 June 21, 2007

- 2 stones standing, large one, and the base of a small one to the south, broken halfway up. The top piece fits on it.

-Large Stone #1

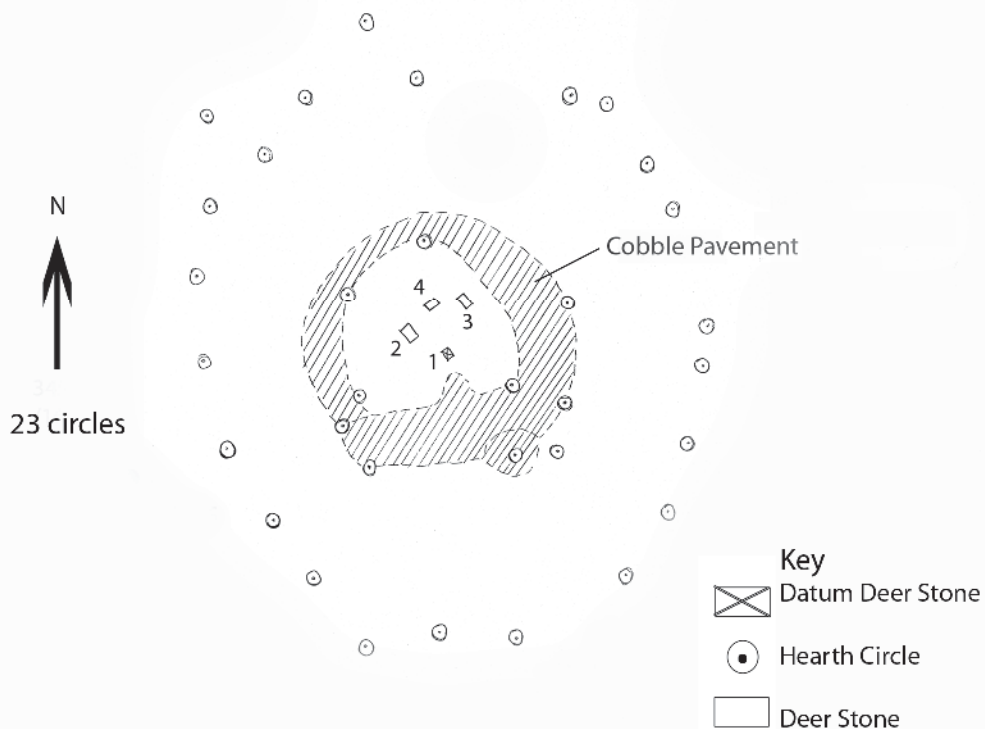


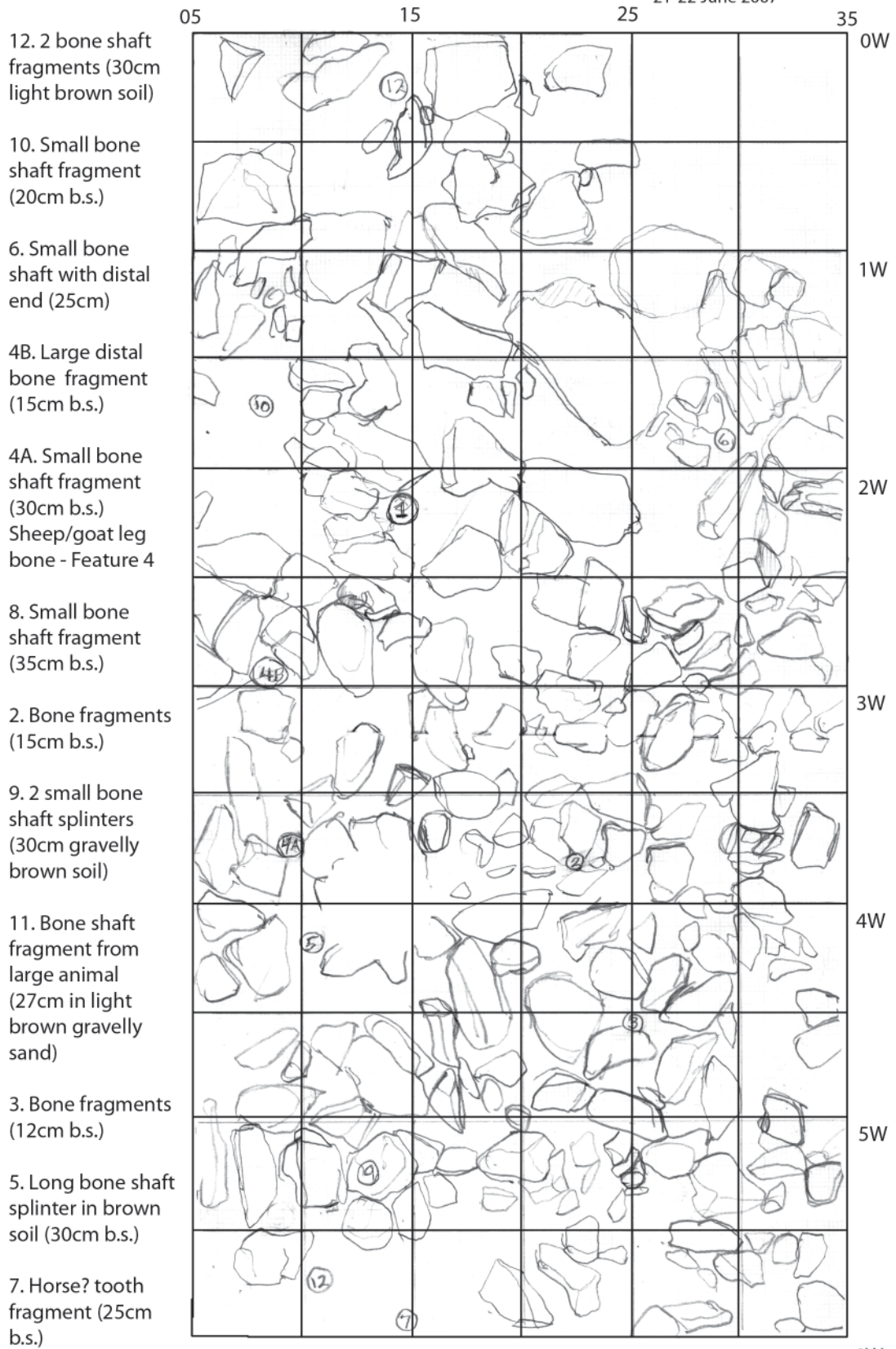
-Small Broken Stone - Deer Stone #2 (Southern)



Western Group

-Three standing stone surrounded by small cobble rings
 -Magnetic/Meters





cal. 2770-2720 BP
 B240690 (tooth)

PART IV

Documentation of Mongolia's Deer Stones, 2007 Field Season

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Institution

OVERVIEW OF THE 2007 FIELD SEASON

The 2007 field season was the third year of conservators' involvement in the field activities of the Joint Mongolian-Smithsonian Deer Stone Project [DSP], directed by William W. Fitzhugh, of the National Museum of Natural History's Arctic Studies Center. Led by senior conservator Harriet F. (Rae) Beaubien (primary author of this report), the MCI team also included Christiane Bathow, an intern at Breuckmann GmbH in Germany, the company that developed a scanner specifically for cultural heritage applications; through a cooperative agreement with MCI, Bathow received additional training in scanning within a museum context.

Our primary objectives during the 2007 field season were (1) to document deer stones at sites that the DSP would be surveying and excavating in Hovsgol aimag, especially the northern Darkhad Valley region; and (2) to complete the documentation of deer stones from the site of Ushkiin Uver, by scanning the two fragments belonging to deer stone #15, currently in the Hovsgol Museum collection. (The deer stones *in situ* were scanned in 2006.) Over a three-week period, complete high-resolution 3D digital records were produced for 14 deer stones from 6 locations including the Hovsgol Museum; these were among 30 partial or complete deer stones documented systematically with photographs and condition records. MCI's participation was supported by funds from the Smithsonian's Under Secretary for Science Endowment and the Samuel H. Kress Foundation.

General Time Line

Beaubien and Bathow arrived in Mongolia on 5 June 2007, meeting up with other members of the DSP team in Ulaanbaatar. Shortly before their arrival, the 4th Annual Symposium of the Joint Mongolian-Smithsonian Deer Stone Project was held in Ulaanbaatar, with conference presentations on current projects of interest to the archaeological community. Results from our previous season's scanning effort were incorporated in Fitzhugh's presentation.

The DSP team left Ulaanbaatar on 6 June, stopping at the deer stone sites at **Olziyt** and **Ulaan Tolgoi** in conjunction with a stop in Muren, the Hovsgol aimag center. There, Beaubien, Fitzhugh and key Mongolian team members visited Dr. Altantsetseg, the director of the Hovsgol Museum, in their temporary quarters in the theater building on the main square. We used this opportunity to distribute copies of field reports and make arrangements for scanning later in the season the recently recovered fragments of Ushkiin Uver's deer stone #15, now stored at the museum.

The team's destination for the first phase of archaeological research was the Shishged River, beyond Tsagaanuur [10-16 June] in the northern Darkhad Valley, passing en route the deer stone at **Tsatstain Khoshuu**. This phase was carried out from our base camp along the Khorgorgo River, north of the Shishged. Excavations included an area adjacent to our base camp, with a prominent stone feature that yielded evidence of lithic activity and a human burial. The scan team provided assistance with excavation as well as cleaning and packaging finds.

From this base camp, other sites that had been identified in 2006 were investigated as pos-

sibilities for scanning including two rock art sites, East Ridge and West Ridge; an *ovoo* nearby at the **Tsagaan Us** pass, which incorporates two stone monuments; and the deer stone sites of **Avtiin** and **Hort Uzuur**. The latter two sites were chosen for excavation and – given time constraints, logistical challenges of accessing the rock art sites with the scanning equipment, and archaeological priorities – selected as priorities for scanning.

The second phase of archaeological research was based at the deer stone site of **Khushuugiin Devseg**, on a plateau east of Lake Erkhel [17-23 June]. This was a focus of scanning activities in 2005, test excavations in 2006 and further exploration and scanning in the 2007 field season. Text excavations and deer stone documentation activities also took place at the sites of **Tumst** and **Khyadag** (located south of Lake Erkhel), with 3D scanning carried out at latter's East and West Groups. While based in this region, we returned to the **Hovsgol Museum** in Muren to scan the fragments of Ushkiin Uver DS #15, which are now considered part of the museum collection. The fragments were stored in a metal cage structure in the backyard of the original museum building, currently unoccupied because of structural problems but scheduled for reconstruction beginning in the summer. Based on the conservators' suggestions in 2006, shortly after their recovery, the fragments had been raised from the ground surface onto blocks of wood and covered with plastic sheet; they appeared to be in good condition. After official negotiations with the museum director and aimag authorities in Muren, and production of a written contract, signed by Ayush, Beaubien and the museum director, we received permission to scan.

After an overnight stop near the Khunuy River, we visited an **unnamed deer stone site** en route to Ulaanbaatar (arriving 24 June). Once in Ulaanbaatar, Beaubien and Fitzhugh were able to meet with Enkhbat, director of the Cultural Heritage Center, to discuss our deer stone documentation work and future participation in CHC's heritage registry program. Beaubien also consulted with the curatorial staff at the National Museum of Mongolian History and assisted the project personnel with registration of the season's finds. The team and equipment returned to the United States on 26 June.

DEER STONE DOCUMENTATION

All conservation activities were recorded in a notebook, supplemented with worksheets for individual deer stones, with descriptive information as well as details about the scanning parameters, digital photographs and the digital scan files. The original documents and additional reports are archived at MCI, in Suitland, Maryland. The deer stone documentation methods and activities are summarized below.

Sites and Monument Designations

For record keeping purposes, the deer stones were identified in as consistent a manner as possible, using previous systems if known. For upright stones, our convention for labeling the individual sides was to begin with the south face (side 1) and continue around the stone clockwise (west as side 2, etc.). For deer stones in fragments, letter designations (A, B) were assigned to fragments, from the top down.



Fig. 1 Olziyt deer stones: (left to right) #3, #2, and #1 (Baubien, 7 June 2007)

Olziyt [Arkhangai aimag, Olziyt sum, Mungun Khundii district]

The site, which the DSP has visited in previous years, was photographed by the MCI team on 7 June 2007. Following the designations used by Volkov (2002) for Site 14, the deer stones are numbered #1-#3 (**Fig.1**); #4 listed by Volkov was not noted by the MCI team.



Fig. 2 Ulaan Tolgoi deer stones (left to right): #4, #5, (most distant), #3, #2 and #1, looking northeast [Beaubien, 2 July 2005]



Fig. 3 Tsatstain Khoshuu deer stone #1 [Beaubien, 9 June 2007]

Ulaan Tolgoi [Hovsgol aimag, Alag Erdene sum]

Following the system used in previous years by the DSP, including for scanning activities in 2005 and 2006, the stones at the site are designated #1-#5, from south to north (**Fig.2**). The site was visited and some of the monuments photographed on 8 June 2007.

Tsatstain Khoshuu [Hovsgol aimag]

The primary stone monument, first recorded by the DSP in 2004 and test-scanned in 2005, is designated #1 (**Fig.3**). The site was visited and photographed on 9 June 2007.

Tsagaan Us ovoo (“White Water pass”) [Hovsgol aimag, Renchinlumbe sum]

This site was visited by the DSP first on 16 June 2006, and again on 11 June 2007. The deer stones incorporated in the *ovoos* are designated #1 and #2 based on prominence; the latter had no obvious markings (**Fig.4**).



Fig. 4 Ovoos at the Tsagaan Us pass, incorporating deer stone #1 (center) and #2 (left) [Beaubien, 11 June 2007]

Avtiin [Hovsgol aimag, Renchinlumbe sum]

This site was initially investigated by the DSP in 2006; 4 deer stones (1 (left) in two fragments) were excavated and the largest one was positioned vertically. They were not given numbers at that time. During documentation, including scanning, and excavation work at the site in 2007 (11-12 June), the MCI team designated them as #1-#4, based on size; the two fragments of #2 were assigned A and B (beginning with the upper one) (**Fig.5**).



Fig. 5 Avtiin deer stones: #1 (background), #2 (A and B), #3 (left) and #4 [Beaubien, 11 June 2007]

Hort Uzuur (“Poison Corner”) [Hovsgol aimag, Renchinlumbe sum, in Tavh Hills]

The site was first investigated by the DSP in 2006 (18-19 June); 6 deer stones were designated as follows: deer stone #1 (southernmost, standing), #2-#4 (in Locus 2, #3 excavated), #5 (in Locus 3, excavated), #6 (northernmost, excavated) (**Figs.6-7**). This numbering system was used during documentation, including scanning, and excavation work at the site in 2007 (13 June).



Fig. 6 Hort Uzuur deer stone #5 [Beaubien, 13 June 2007]



Fig. 7 Hort Uzuur deer stones: #1 in background and (left to right) #2-#4, looking south [Beaubien, 13 June 2007]

Khushuugiin Devseg [Hovsgol aimag, Alag Erdene sum]

Until 2007, the site had only two visible deer stones, designated #1 and #2 (south to north) by the DSP. Provisionally named Erkhel East 1 when the stones were scanned in 2005, it was renamed at the time of the DSP's 2006 excavations. Excavations by the DSP in 2007 uncovered a third fallen stone to the south, designated #3, which was erected in an approximate position, generally aligned with the others (**Fig.8**). Documentation in 2007 included 3D scanning.



Fig. 8 Khushuugiin Devseg deer stones: (left to right) #2, #1 and #3, looking south [Beaubien, 21 June 2007]

Khyadag – West Group [Hovsgol aimag, Buren Togtokh sum]

The site was briefly visited by the DSP in 2002, with no deer stone



Fig. 9 Khyadag West Group deer stones: (left to right) #2-#4 and #1, looking east toward the East Group [Beaubien, 18 June 2007]

numbering system used. In 2007, the MCI team designated them #1-#4, moving clockwise from the tallest one (#1, southernmost of the group) (**Fig.9**). This system was used for documentation, including scanning, during excavation work at the site (18 and 21 June).

Khyadag – East Group [Hovsgol aimag, Buren Togtokh sum]

The site was briefly visited by the DSP in 2002, with no deer stone numbering system used. In 2007, the MCI team designated the prominent deer stone as #1, with the vertical stone in 2 fragments, nearby to the northwest, as #2A (upper) and B (**Fig.10**); other fragments in this group may be deer stone fragments, but were not numbered by the MCI team. These designations were used for documentation, including scanning, during excavation work at the site (18 and 21 June).



Fig. 10 Khyadag East Group deer stones in the main cluster: (left to right): #1 and #2 (A and B), looking west toward the West Group [Beaubien, 21 June 2007]

Ushkiin Uver [Hovsgol aimag, Muren sum]

The deer stone designations follow those used by Volkov (2002) for Uushigiin Övör (Site 67), also used by Permanent Archaeological Joint Mongolian and Japanese Mission [PAJMJM], which has been investigating the site (called Ulaan Uushig I) since 1999. Deer stone #15, recorded intact by Volkov, had disappeared from the site at some point in the past, but two fragments recovered in 2005, and now in the Hovsgol Museum, are from this monument (Figs.11-13). The fragments were first photographed by the 2006 MCI team, after Ushkiin Uver's *in situ* deer stones had been scanned. The fragments were designated A (upper) and B (middle), for documentation and scanning in 2007.



Fig. 11 Ushkiin Uver deer stone #15 fragments at the Hovsgol Museum: A (right) and B [Beaubien, 26 June 2006]

Tumst [Hovsgol aimag, Alag Erdene sum]

The site was found by the DSP in 2007. The one standing stone was designated #1; the other two were arbitrarily designated #2 (larger) and #3 by the MCI team (Fig.14).

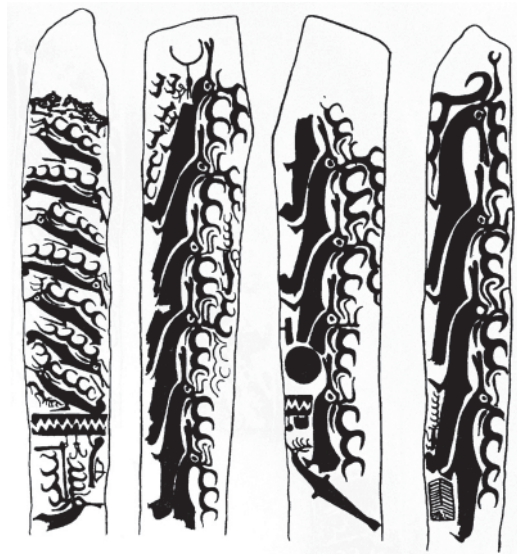


Fig. 12 Illustration of Ushkiin Uver deer stone #15 (in situ) from Volkov [2002: 193, T 78]. The sequence of sides (front, right, left, back) corresponds to MCI sides 1-2-4-3.

Site (unnamed), between the Khunuy River and Ulaanbaatar
The sole standing stone at the site was designated #1 by the MCI team, and photographed (Fig.15).



Fig. 13 Rice paper rubbing of deer stone #15 fragments [from PAJMJM 2005:85]. The sequence of sides follows Volkov (see Fig. 12) and corresponds to MCI sides 1-2-4-3.

Unknown provenience, now National Museum of Mongolian History, Ulaanbaatar
This deer stone was recently erected in front of the museum, and was photographed by the MCI team in 2007 (Fig.16).



Fig. 14 Tumst deer stones: #1 (background), #2 (right foreground) and #3 [Beaubien, 20 June 2007]

General Documentation



Fig. 16 Deer stone at the National Museum of Mongolian History, Ulaanbaatar [Beaubien, 25 June 2007]

Individual worksheets were used in order to standardize the information being collected for each deer stone. Condition notes and measurements were recorded on sketch drawings of each side, noting features such as deep cracks, spalling cracks, areas of delamination, and losses; lichen, bird droppings and other biological accretions; stains from human applications and from animal rubbing; mineral crusts, concrete residues, and graffiti. Site location and elevation were recorded with a Garmin GPS device.



Fig. 15 Deer stone at a site en route to Ulaanbaatar [Beaubien, 24 June 2007]

Directional orientation of the footprints of erected deer stones were recorded with a compass on sketch plans. Any cleaning actions were also recorded, which included occasional removal of accretions using bamboo skewers and toothbrushes, and clearance of loose stones and plant growth at the bases prior to scanning. Digital photographs were taken of all accessible sides; these incorporated label, standard color and dimension scales

whenever possible. Separate worksheets were also filled out for deer stones that were 3D scanned, to record scanning conditions, instrument settings, and file processing details.

3D Scanning

Scanning Equipment

A Breuckmann triTos (GmbH) structured light system was used for scanning in 2007, based on a successful field season of use in 2006. Its components include the tripod-mounted sensor bar (in this case 30 cm long) with projector and camera, and the controller, safely transported within a custom-made hard case (Fig.17).

The camera lenses are interchangeable to give varying fields of view; in this case, 675 mm lenses were used, which allowed a field of view of 67 cm on the diagonal for each “patch,” with a working distance of 1.085 m. The scanner’s projected light patterns are calibrated using optical calibration plates, housed separately in a hard case. The triTos system software was run on a Hewlett-Packard Pentium IV laptop computer. The computer and scanner were powered in the field by a Honda EU1000i generator developed specifically for use with precision equipment, used during the previous two field seasons and stored in the interim in Ulaanbaatar.

Scanning Process (general)

A 3D file for the object is constructed from “patches” of data that are stitched together during the scanning process. For each patch, the proper working distance is established by aligning two laser dots on the object’s surface, and then a series of organized patterns of structured light is projected in quick succession (Figs.17-18). The patterns are simultaneously photographed using a digital camera that is aligned with the projector. The photographic images capture the edge distortion of the projected light pattern as it strikes the object, as well as color information. The system software processes

the distortion and color information to generate 3D point cloud data. Because the point cloud's (XYZ) range and (RGB) color values are recorded together, the color information is registered exactly with its corresponding 3D point. After the light sequence is completed, the patch of new data

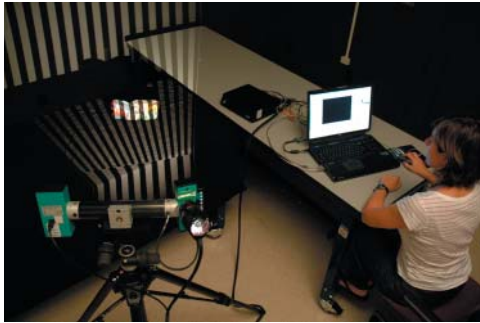


Fig. 17 Scanning set-up at MCI, showing the tripod-mounted camera and projector, the controller on the table with the computer, and the graphic display of scan data in progress on the computer screen [2007]

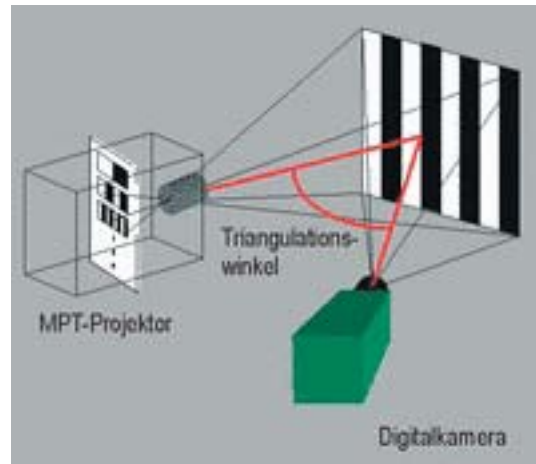


Fig. 18 Diagram of the triangulation method used to measure edge distortion in the projected light pattern [<http://www.beuckmann.com>, 2007]

is displayed graphically on the computer screen; it can be added to the previously acquired data by aligning several overlapping surface feature details. The data file can be temporarily closed and reopened, which allows the scanning process to be carried out in more than one phase if necessary.

The triTos system has a triangulation angle of 20 degrees, which allows for fewer scans and better data capture on objects with complex geometry, e.g., areas of high relief, although the tripod mounting can also inhibit access to some surfaces. Even with the lowest resolution lens, the resolution is 15-20 microns.

Field Procedures

The structured light scanning system is somewhat sensitive to light conditions, which can affect contrast in the light patterns projected onto the object. Day-time scanning required that temporary shade shelters be built over the deer stones, large enough to accommodate the working distance between the tripod-mounted sensor bar and surfaces to be scanned. Fortunately, the Breuckmann scanner was not adversely affected by cold temperatures, so we were also able to scan at night. Night scanning proved to be the most effective arrangement, obviating the need for a shelter and providing ideal light-contrast conditions to produce excellent data (Fig.19). This approach was used to scan the deer stones at the sites of Khushuugiin Devseg and Khyadag, which were easy to access by van; the nearly 3-meter deer stone (#1) in the Khyadag West Group would have otherwise been extremely difficult to shade adequately.

Day-time scanning was carried out when schedules needed to be synchronized with the archaeological team, such as at Avtiin and Hort Uzuur, or with staff at the Hovsgol Museum. At these locations, shelters were constructed using medium-weight canvas (40 m, sewn into a 10 m x 6 m panel), draped on a structure constructed using 5-meter



Fig. 19 Khushuugiin Devseg deer stone #1 being scanned at night [Beaubien, 21 June 2007]

wooden poles borrowed from nearby animal corrals (**Fig.20**), or – at the museum – over the metal cages (**Fig.21**).



Fig. 20 Atviin deer stone #1, with shelter being set up for day-time scanning [Bathow, 12 June 2007]

Our procedure typically included mechanical removal of dimensional accretions (mostly bird droppings) and intrusive grass or stones around the base, prior to scanning. Bathow calibrated the scanner at the beginning of each session, recalibrating only if environmental conditions changed dramatically; she operated the computer during scanning, while Beaubien handled the tripod. The scan process for each deer stone was completed within a single session, with the exception of one that was interrupted by rain. The time needed for scanning ranged from just under 0.5 to over 3.5 hours (see the table for specific times). Given time and logistical constraints in the field and computer memory requirements, the

processing phase (outlined below) is currently taking place at MCI.

Data Processing (on-going)

The raw data files from structured light scanning are very large, but can be stored on the laptop computer; they are generally of excellent quality and relatively unflawed. The minimal noise arises from overlaps and alignment during scanning, and is easily filtered out during processing. This is being done by B. Vicky Karas at MCI in two steps, which is expected to take approximately 6 hours per deer stone data file, based on previous experience with the 2006 data.

In the first step, the triTos system software (Optocat 2006) is used to convert the raw data files into STL and PLY files. The PLY format, in particular, is designed to store 3D data with a variety of properties, such as color information, surface normals and texture coordinates; these features allow the front and back sides of the surface data's polygonal mesh to have different properties. These are exported to Rapidform (XOS or 2006) 3D graphic software, used in the second step for all further processing. This includes alignment and merging, and filling holes. The software allows the operator to select the particular holes to fill and creates a fill by extrapolating curvature from the data mesh surrounding the hole. The fills are displayed as a uniform mesh (in mesh view), or as a smooth patch for larger fills (in solid view), so that fills are always detectable. The fully processed data files are saved as new STL and PLY files (formats that can be exported to a variety of software applications). These files are archived at MCI under site-specific project numbers, and can be copied to CD with a free viewer program for distribution.



Fig. 21 Ushkiin Uver deer stone #15 fragments at the Hovsgol Museum, being sheltered for day-time scanning [Baubien, 19 June 2007]

Mongolia Deer Stone Project: Field Report 2007

Summary of Documentation Activities in 2007: The following table summarizes the types of information produced by the MCI team.

KHUSHUUGIIN DEVSEG, east of Lake Erkhel (Hovsgol aimag, Alag Erdene sum)			
KD.01	Vertical, complete to top	2007: photos 4 sides, top (HFB 18-21jun07); condition record [2005, as EE1.01: see <i>MCI 5974, 6086.1</i> , and Deer Stone Archives Report 1, filed under <i>MCI 5945</i>]	Complete raw data file of above-ground portion (21jun07) – scan time 1 hr.15 min.; see <i>MCI 6086.2</i>
KD.02	Vertical, complete to top	2007: photos 4 sides, top (HFB 18-21jun07) [2005, as EE1.02: see <i>MCI 5974, 6086.1</i> , and Deer Stone Archives Report 1, filed under <i>MCI 5945</i>]	–
KD.03	Excavated, complete; erected in 2007	2007: photos 4 sides, top, bottom (HFB 18-21jun07); condition record, footprint/orientation (after positioning), cleaning notes	Complete raw data file of entire object (20jun07) – scan time 1 hr.15 min.; see <i>MCI 6086.2</i>
KHYADAG – West Group, south of Lake Erkhel (Hovsgol aimag, Buren Togtokh sum)			
KW.01	Vertical, complete to top	2007: photos 4 sides (HFB 18,21jun07); condition record, footprint/orientation; cleaning notes	Complete raw data file of above-ground portion (22jun07) – scan time 3 hr.40 min.; see <i>MCI 6158</i>
KW.02	Vertical, complete to top	2007: photos 4 sides, top (HFB 18,21jun07); condition record, footprint/orientation, cleaning notes	Complete raw data file of above-ground portion (20jun07) – scan time 1 hr.15 min.; see <i>MCI 6158</i>
KW.03	Loose, complete to top	2007: photos 2 sides, top, bottom (HFB, 18,21jun07); condition record, cleaning notes	Complete raw data file of entire object (20jun07) – scan time 1 hr.10 min.; see <i>MCI 6158</i>
KW.04	Vertical, complete to top	2007: photos 4 sides (HFB 18,21jun07); condition record, footprint/orientation, cleaning notes	Complete raw data file of above-ground portion (19-20jun07) – scan time 1 hr.55 min.; see <i>MCI 6158</i> .
KHYADAG – East Group, south of Lake Erkhel (Hovsgol aimag, Buren Togtokh sum)			
KE.01	Vertical, complete to top	2007: photos 4 sides (HFB 18,21jun07); condition record; footprint/orientation, cleaning notes	Complete raw data file of above-ground portion (21-22jun07) – scan time 1 hr.30 min.; see <i>MCI 6158</i>
KE.02A	Loose fragment, top portion	2007: photos 4 sides, top (HFB 18,21jun07); condition record	–
KE.02B	Vertical, lower portion	2007: photos 4 sides, top (HFB 18,21jun07); condition record, footprint/orientation	–
USHKIIN UVER (Hovsgol aimag, Muren sum) – now at MUREN, Hovsgol Museum			
UU.01 to UU.14, UU.x1 to U.x3	Various: Vertical (complete to top, incomplete), Loose fragments	2007: not photographed [2005, 2006: see <i>MCI 5974, 6047, 6084.1</i> and <i>6089</i>] [Also: Volkov 2002:78-83, 187-194 Tables 72-79]	–
UU.15A	Loose fragment, from near top	2007: photos 4 sides, top and bottom breaks (HFB, CB 19jun07) [2006: photos 4 sides, top, break (HFB, 26jun06)] [Also: Volkov 2002:193-Table 78; PAJMJM 2005:73-74 Fig.21 – photo: R side, 85 Pl VIII – rubbings 4 sides, details; Shu <i>et al.</i> 2006:75, 102 Pl 20.2, drawings 4 sides]	Complete raw data file of entire fragment (19jun07) – scan time 1 hr.50 min.; see <i>MCI 6084.2</i>
UU.15B	Loose fragment, from middle	2007: photos 4 sides, top and bottom breaks (HFB 19jun07) [2006: photos 4 sides, 2 breaks (HFB, 26jun06)] [Also: Volkov 2002:193-Table 78; PAJMJM 2005:73-74 Fig.21 – photo: R side, 85 Pl VIII – rubbings 4 sides, details; Shu <i>et al.</i> 2006:75, 102 Pl 20.2, drawings 4 sides]	Complete raw data file of entire fragment (19jun07) – scan time 40 min.; see <i>MCI 6084.2</i>
TUMST, east of Lake Erkhel (Hovsgol aimag, Alag Erdene sum)			
DS.01	Vertical, complete to top	2007: photos 4 sides, top (HFB 20jun07)	–
DS.02	Loose, nearly complete	2007: photos 4 sides, bottom break (HFB 20jun07)	–
DS.03	Loose, nearly complete	2007: photos 3 sides, bottom break (HFB 20jun07)	–
Site (unnamed) (XXXX aimag, XXXX sum)			
DS.01	Vertical, complete to top	2007: photos 4 sides (HFB 24jun07)	–
Site (unknown) - now ULAANBAATAR, National Museum of Mongolian History			
DS.01	Vertical, complete to top	2007: photos 4 sides, top (HFB 25jun07)	–

KHUSHUUGIIN DEVSEG, east of Lake Erkhel (Hovsgol aimag, Alag Erdene sum)			
KD.01	Vertical, complete to top	2007: photos 4 sides, top (HFB 18-21jun07); condition record [2005, as EE1.01: see <i>MCI 5974, 6086.1</i> , and Deer Stone Archives Report 1, filed under <i>MCI 5945</i>]	Complete raw data file of above-ground portion (21jun07) – scan time 1 hr.15 min.; see <i>MCI 6086.2</i>
KD.02	Vertical, complete to top	2007: photos 4 sides, top (HFB 18-21jun07) [2005, as EE1.02: see <i>MCI 5974, 6086.1</i> , and Deer Stone Archives Report 1, filed under <i>MCI 5945</i>]	–
KD.03	Excavated, complete; erected in 2007	2007: photos 4 sides, top, bottom (HFB 18-21jun07); condition record, footprint/orientation (after positioning), cleaning notes	Complete raw data file of entire object (20jun07) – scan time 1 hr.15 min.; see <i>MCI 6086.2</i>
KHYADAG – West Group, south of Lake Erkhel (Hovsgol aimag, Buren Togtokh sum)			
KW.01	Vertical, complete to top	2007: photos 4 sides (HFB 18,21jun07); condition record, footprint/orientation; cleaning notes	Complete raw data file of above-ground portion (22jun07) – scan time 3 hr.40 min.; see <i>MCI 6158</i>
KW.02	Vertical, complete to top	2007: photos 4 sides, top (HFB 18,21jun07); condition record, footprint/orientation, cleaning notes	Complete raw data file of above-ground portion (20jun07) – scan time 1 hr.15 min.; see <i>MCI 6158</i>
KW.03	Loose, complete to top	2007: photos 2 sides, top, bottom (HFB, 18,21jun07); condition record, cleaning notes	Complete raw data file of entire object (20jun07) – scan time 1 hr.10 min.; see <i>MCI 6158</i>
KW.04	Vertical, complete to top	2007: photos 4 sides (HFB 18,21jun07); condition record, footprint/orientation, cleaning notes	Complete raw data file of above-ground portion (19-20jun07) – scan time 1 hr.55 min.; see <i>MCI 6158</i> .
KHYADAG – East Group, south of Lake Erkhel (Hovsgol aimag, Buren Togtokh sum)			
KE.01	Vertical, complete to top	2007: photos 4 sides (HFB 18,21jun07); condition record; footprint/orientation, cleaning notes	Complete raw data file of above-ground portion (21-22jun07) – scan time 1 hr.30 min.; see <i>MCI 6158</i>
KE.02A	Loose fragment, top portion	2007: photos 4 sides, top (HFB 18,21jun07); condition record	–
KE.02B	Vertical, lower portion	2007: photos 4 sides, top (HFB 18,21jun07); condition record, footprint/orientation	–
USHKIIN UVER (Hovsgol aimag, Muren sum) – now at MUREN, Hovsgol Museum			
UU.01 to UU.14, UU.x1 to U.x3	Various: Vertical (complete to top, incomplete), Loose fragments	2007: not photographed [2005, 2006: see <i>MCI 5974, 6047, 6084.1</i> and <i>6089</i>] [Also: Volkov 2002:78-83, 187-194 Tables 72-79]	–
UU.15A	Loose fragment, from near top	2007: photos 4 sides, top and bottom breaks (HFB, CB 19jun07) [2006: photos 4 sides, top, break (HFB, 26jun06)] [Also: Volkov 2002:193-Table 78; PAJMJM 2005:73-74 Fig.21 – photo: R side, 85 Pl VIII – rubbings 4 sides, details; Shu <i>et al.</i> 2006:75, 102 Pl 20.2, drawings 4 sides]	Complete raw data file of entire fragment (19jun07) – scan time 1 hr.50 min.; see <i>MCI 6084.2</i>
UU.15B	Loose fragment, from middle	2007: photos 4 sides, top and bottom breaks (HFB 19jun07) [2006: photos 4 sides, 2 breaks (HFB, 26jun06)] [Also: Volkov 2002:193-Table 78; PAJMJM 2005:73-74 Fig.21 – photo: R side, 85 Pl VIII – rubbings 4 sides, details; Shu <i>et al.</i> 2006:75, 102 Pl 20.2, drawings 4 sides]	Complete raw data file of entire fragment (19jun07) – scan time 40 min.; see <i>MCI 6084.2</i>
TUMST, east of Lake Erkhel (Hovsgol aimag, Alag Erdene sum)			
DS.01	Vertical, complete to top	2007: photos 4 sides, top (HFB 20jun07)	–
DS.02	Loose, nearly complete	2007: photos 4 sides, bottom break (HFB 20jun07)	–
DS.03	Loose, nearly complete	2007: photos 3 sides, bottom break (HFB 20jun07)	–
Site (unnamed) (XXXX aimag, XXXX sum)			
DS.01	Vertical, complete to top	2007: photos 4 sides (HFB 24jun07)	–
Site (unknown) - now ULAANBAATAR, National Museum of Mongolian History			
DS.01	Vertical, complete to top	2007: photos 4 sides, top (HFB 25jun07)	–

PART V

Ethnographic Report on Northern Mongolian Ethnic Groups

Tseel Ayush
National Museum of Mongolian History

Brief Ethnographic Field Report on Lifestyles of Northern Mongolian Ethnic Groups

In June of 2007 the Mongolian-American “Deer stone” project team organized the fourth scientific symposium on the results from field research. In the symposium, some 11 reports were discussed, focusing on the recent work in the western, northern and southern parts of Mongolia in the last few years. In this report I will discuss some of the new results of ethnographic surveys conducted this year and outline aspects of the life-ways of herders in northern Mongolia. This year, instead of carrying out research with Marilyn Walker of Mount Allison University of Canada, I joined the archaeological team, headed by William Fitzhugh, after their trip to Bayan Ulgi in western Mongolia and accompanied them to their second session in Tsagaan nuur, Rinchinlumbe, and Burentogtokh sums of Khuvsgul aimag from June 6 to July 1.

We first visited the border areas of Rinchinlumbe and Tsagaan nuur sums where the Hogorgo and Shishgid rivers join. While the archaeological team excavated a round-shaped burial on the western bank of the Hogorgo river, I visited several families residing nearby and took notes through questions and observation regarding their diet (especially consumption of meat and dairy

product), dwellings, traditional dress, treatments for ailing people and herds, and religious customs. These families had recently moved to this place for summer encampment. I also collected information related to the ethnic distinctions of populations residing in these sums from the governor of Tsagaan Nuur sum.

In total, I visited three families who were residing near the excavation site on June 11-13. The first family’s husband and wife were from Sharnuud clan of the Darkhad ethnic group. The wife of the second family is also Sharnuud Darkhat and her husband belongs to the Soyot clan of Tuva. The husband of the third family is of the Urad clan and the wife is Sharnuud. The first family, whose head is named Kh.



Fig. 2 Curds mixed with wild onion for flavor

Batsukh, has 30 cattle, about 30 goats, 4 horses for transportation, and some sheep. The family was living in a wooden house, but in winter they mostly live in a felt ger. During summer time when the weather is wet and warm, most people tend to live in small wooden houses.



Fig. 1 Fresh curds sliced into small pieces



Fig. 3 One kind of Salted Wild Onion

grayling and lenok. The people in this area no longer catch fish by the traditional small nets woven out of horse tail hair and instead use wooden poles with a hook made from animal bones. The fish is fried or boiled, as it is traditionally done in Mongolia. Recently, locals have been putting fish in pie or preserving it in can. This is prepared by cutting the fish into small portions, adding oil, onions, pepper and bay leaves in a bottle, and then capping the bottle and boiling it in water for a length of time. Water is not added directly into the bottled fish. This kind of processed bottled fish is sometimes also sold in the market. The fish is also preserved for a long period through a process of drying. The head and the tail of the fish are separated, after which the mid section of the fish is cut open and salt is added before drying. After the fish has been dried, it is pounded together with the bone, ready for a broth or soup dish.

Milk products mainly come from cattle and goats. In the warmer seasons (late May to October) yogurt, dried curds, cheese, clotted cream and cottage cheese are produced, a tradition common throughout Mongolia. Here, the natives of Khuvsgul have a tradition to prepare clotted cream and dry curds in large quantity to consume in winter season. To prepare *aaruul* or dried curd, milk is mixed with yogurt and boiled. Then it is put in a fine cloth, pressed between two wooden boards weighted down with heavy stones, and the liquid is drained to become what is called *arts* curd. The solid cake is then sliced into thin pieces and placed on a drying table with two shelves in front of the south facing gers or on the roof of the gers to dry. In the late autumn season, the curds are not sliced but broken into large pieces to dry. Another product processed from milk is *eezgii*. The milk is combined with yogurt, and after curdling, it is cooked until all the liquid has gone. *Byaslag* is made by adding yogurt into boiled milk, and after the milk curdles, the solid mass is put in a large cloth bag. The liquid is then drained out pressed between weighted wooden boards. The processed *byaslag* has a square shape and is sliced into thin pieces. The natives of this region also have their own unique way of preparing a special dish from *byaslag*, and it is the first time such information



Fig. 4 Wild "white" potatoes

has been collected. The *byaslag* is flavored with mainly onions and salt and cooked as a “cheese pie.” It is a tradition to cook *buuz* dumplings by steaming and *khushuurs* by frying. *Byaslag* is also cut into long slices and added to soup instead of noodles. Another traditional milk product is *urum*, or clotted cream. It is consumed daily and Mongolians tend to keep it for a long time. The method of processing *urum* is simple. Milk is heated just below boiling, stirring at regular intervals to create foam. Once there is enough foam, the milk is cooled down slowly and then stored in a cool dry place where it stays fresh for a long time. From *urum*, two kinds of components are prepared, traditionally by hand. For one recipe, *urum* is put in a bowl with cold water, squeezed repeatedly by hands until butter is extracted, and the liquid is used for making *aaruu*. The kind of butter is stored in a container, and either put on bread or mixed with flour to make *boortsog*, or fried dough cookies.



Fig. 5 Codon boots made of reindeer skin

Information on ingredients used for flavoring was collected from the locals. The most common ingredients are wild onion and mangir, another type of onion (*Allium senescens* L.). Wild onions are collected during late autumn and stored, while mangir is cut into pieces after being collected, mixed with curds, and dried. It can be added to soup for flavor. *Juutsai*, another type of onion ingredient, is also used for flavor. Salt is added to bottled *juutsai* and stored for long time. When flour was rare, roots of wild plants were used in the diet. The most common of these are the roots of white and yellow wild “potatoes” (*Lilium pumilum* and *Lilium martagonium*) found abundantly in the region. Viviparous snake-weed is also used to flavor food or as a substitute for flour. Herbal



Fig. 6 Back loading cattle

tea is of course a famous part of the diet among all Mongolian people, and several kinds of wild herbs are used for making tea, including the leaves of barberry (*Berberis sinensis*). They are collected in the summer and autumn, and dried and stored for the winter. Wild black currants (*Ribes nigrum* L.), currants (*Ribes altissimum*), and cranberries are picked during autumn. Some are preserved for medicinal use.

There are several kinds of herbs utilized for treating human illnesses as well as for cattle, and fish serve many medicinal purposes. Fish liver and gall bladder are considered excellent for treating a cough. The gall bladder of white fish is valued for treating lung disorder, and white fish possess properties to cure edema. Weak and feeble livestock are given fish soup to gain strength. White mushrooms are not only consumed with food but also favored for their property to cure fever in cattle.

The second family belongs to the Tuva ethnic group and exemplifies more distant move-



Fig. 7 Basket made of cattle hide

ment patterns over generations. The head of the family, B. Munsuu, was born in Tuva and moved south with his father into Mongolia when he was six years old. In the beginning he occupied himself with herding reindeer in the neighboring sums, and later in the 1950s he joined the local fishery industry established in Tsagaan Nuur sum. This is one example of a Tuva family settling into a new environment and way of life. Although the family has left the occupation of reindeer herding, they still tend to keep traditions of their own. As the Tsaatan, or so-called reindeer people, live in the Sayan mountain region on the border with Russia, their cultural traditions, and sometimes dress, differ

considerably from Mongolian people. We obtained information on some of the clothing of reindeer people. Tsaatan shoes or boots, called *godon*, are made from the skin of a reindeer hind leg. The fur side is turned outward and the boots have one layer of leather for sole. This differs from traditional Mongolian boots which have multiple layers of sole sewn together. Tsaatan boot tops are traditionally long for walking in the deep snow, though this style is not much used. Some of the older generations of reindeer people still wear trousers made from the tanned hide of female brown deer (*Capreolus capreolus L.*). The hides are carefully smoked to prevent them from getting damp. While these kind of trousers are seldom worn by most Tsaatan, *godon* boots are still worn for hunting.

Traditionally, reindeer people in summer covered their tents with birch bark. In winter and spring, the cover for the tent was made from tanned reindeer and roebuck skin. In the forest the rainfall is plentiful, so bark was used as a rain cover for the tents. Bark can be easily peeled off from birch trees during spring. The pieces are boiled in water to soften the bark and then dried and sewn together with threads of sheep wool. The birch bark is not only water repellent but strong and does not deteriorate easily. When they leave for the other seasonal camps, the birch barks are rolled up to prevent from becoming deteriorated and left at the summer camp under large trees. After returning to the camp, the barks are used again for covers. According to the locals, reindeer people had practiced the tradition of birch bark covers for the tent up until the middle of the last century. In the 1950s, when Tsaatan people started their livelihood as fishermen, the Mongolian government showed support by providing wooden houses for those who stayed in the sum center. For those who stayed with the reindeer in the mountains, the government gave them canvas as for covers for the tent. Since then, the use of birch bark covers has almost been forgotten. One such birch bark cover is displayed in the Tsagaan Nuur museum. Containers for milk and milk products are also made of birch bark.

Another peculiarity of Khuvsgul traditional culture is the use of reindeer as well as oxen and horses are commonly used for loading goods. Specifically around Lake Kuvsgul, the horse sled is particularly important as it is convenient to use in north-central Mongolia where snow fall is heavy in the winter. The sled is made of birch wood and so remains strong for extended periods of time. During summer the sleds are kept in the winter campgrounds under coverage. For loading goods, the locals make several kinds of baskets of various sizes from hides called *barav* and *amchag*. In the high mountain areas, small *barav* baskets are made from the skins of reindeer and roebucks for loading goods on the reindeer. However, people in the lowlands produce larger *amchag* baskets made from cattle hides to load goods on oxen and horses. The larger *achmag* baskets require two small cow hides, or the hide of a single large cow. The hides for both kinds of baskets are tanned, the thin

parts around the edges are cut out, and the thick parts are used for making baskets.

The last topic I collected information about was the religious history of the region. The people have long practiced Shamanism, but some of them have combined Shamanism and Buddhism. Still, others were converted completely to Buddhism, abandoning Shamanism altogether. At the end of 1930s, during political oppression, Shamanism, along with Buddhism, was forbidden yet secretly practiced. But in the 1990s religious freedom was restored. Some Buddhist temples have been constructed in the sum center and a few monks carry out religious rituals in temples and homes. The Tsaatan reindeer people of the mountains, as well as Darkhad and Tsaatan people herding livestock in the lower regions, have resumed shamanistic practices. Nevertheless, there are some people who dislike the more recent shamans, believing them to be fraudulent business makers.

It is still of great importance to study the history of Shamanism as it is a reflection of the mindset of people and reflects historical change. We therefore gathered as much information as we could about the form of shaman spirits. The core concept of shamanism is the guardian or the ancestral spirits known as *ongod*. The shamans believe that the spirits transform into material things (e.g. needles, cinders) or animals (foxes, birds etc.). This concept is undoubtedly an ancient concept. According to research on Siberian and Mongolian Shamansim, only in later periods do the shaman spirits connect with humans or take anthropomorphic form. From the information we gathered from members of the third family, incidents of spirit vengeance between competing shamans can be reconstructed. It is believed that a vengeful spirit can transform into a bird that roosts over a ger, and then changes into ash, falling into the prey shaman's cup of tea. The tea when taken leads to destruction.

Family spirits are often contained within simple objects. These sacred objects are then kept inside a small cloth bag which is usually hung in the north side of the home. We learned that the third family's spirit bag contains their father's pair of vulture claws, a human figurine, long fragments of white cloth and other small items. The vulture claws are significant as it might relate to the tradition of shamanistic familiars, and thus informs us of the relationship between the spirit and the bird. The second family is a dedicated worshiper of one particular tree. Every year, in the early month of autumn, Munsuu, along with his children, pay homage to the tree, offering milk and vodka and tying strips of white cloth around the tree. They believe that the spirits of deceased male and female shamans are reborn in the mountain and trees. The first family I visited showed me an interesting item.

Kh.Batsukh had preserved the skull of a wolf he found several years before in the belief that it would protect his livestock from wolves. In other regions of the country, it is a tradition to keep paintings of wolves. For example, hanging a painting of a wolf's four legs chained up together or tying a pair of fire tongs with a string during the night is said protect livestock from the wolves.



Fig. 8 Wolf skull as amulet for protecting livestock

PART VI

Bronze Age Burial Mound Excavation in the Hovsgol Aimag, Northern Mongolia

Bruno Frohlich, Tsend Amgalantugs, David Hunt

The 2007 field season in Mongolia was conducted as a collaborative research project between Smithsonian and the Mongolian Academy of Sciences. A new three-year contract was negotiated and signed in December 2006 to continue research begun in 2003 on Bronze Age burial mounds in Hovsgol aimag and 20th century mass burials in Ulaanbaatar, and in 2004 on mummified human remains from the Gobi Desert. Furthermore, we are continuing our educational and advisory relationship with the Institute of Archaeology at the Mongolian Academy of Sciences including language training and consulting on collection management.

Our 2007 field season from late May to early July focused on the excavation of 19 burial mounds and two smaller structures of unknown origin. We also ‘ground-truthed’ areas south of the Delgermoron River to verify the presence of burial mound structures earlier identified on high resolution satellite images.

The 2007 team, which was significantly larger than in previous seasons, totaled 27 individuals (see photo). Bruno Frohlich and Tsend Amgalantugs co-directed the expedition, representing respectively the Smithsonian Institution and the

Mongolian Academy of Sciences. They were assisted by 16 scientists and support staff from Mongolia, the USA, and New Zealand, as well as nine Mongolian students. In the past Mongolian students have made important contributions and we were not disappointed this year. Our students from Ulaanbaatar and Muron demonstrated plenty of energy, high motivation, and an enthusiastic interest and included (in random order) Batsukh Dumbuu, Ravdanbat Baldan, Byambadorj Bayanjargal, Tsetsegee Bat-Erdene, Altantsetseg Ankhbayar, Choisureen Uuriintuya, Tsend-Ayush Tsog-Erdene, Erdene-Oshir Amarbold, and Badnaa Azbayar. Our two cooks, Lumben Bolorma and Munkhjargal Erdenechimeg, assisted by Bolorma’s daughter Baterdene Bayartsengel, kept all of us well-fed with excellent traditional Mongolian cuisine, now and then with some American and Korean fare. Our chefs even excelled at keeping our vegetarian members in good nutritional shape.

Participants from the Institute of Archaeology in Ulaanbaatar included Erdene Batshatar (researcher), who has been working with us since 2003 on several projects including surveys, mass burials, and the Gobi mummies; Delgermaa Lchagvadorj (zoo-archaeologist), who worked closely with David Hunt (Smithsonian Institution) and Judith Littleton (University of Auckland, New Zealand) on human and non-human remains; Davaasuren Mandarkh (researcher) who participated in a December 2006 survey of an early hominid site in northeastern Mongolia; and Sundev Manlaibaatar from the National Museum of Mongolian History. Our expert drivers included Burdorj Tumor,



Fig. 1: 2008 Team at the Ushkiin Uver deer stone complex, Hovsgol aimag, Mongolia. Missing are: Steve Young, Zach Thompson, Lumben Bolorma, Bruno Frohlich, and a student

Ganjuur Sukhbaatar, and Sukhbaatar Erdene. Tumor has also been a trusted advisor and excellent map reader. Judith Littleton joined David Hunt in analyzing and curating the human remains. Their work also included studies of remains from the 2006 season (see photo). Steve Young of the Center for Northern Studies at Sterling College collected samples of indigenous plant life and peat bogs. Eliza Wallace of Boston University supervised the excavation of burial mounds for the second year and holds the record in finding human skeletal remains in all mounds excavated under her supervision. Thomas Frohlich, presently attending Hobart and William Colleges, completed architectural drawings of all excavated and exposed structures and also surveyed land areas around the excavated mounds. Zach Thompson, a student from Connecticut, assisted with photography and surveying.



Fig. 2: Judith Littleton from the University of Auckland in New Zealand and David Hunt, Smithsonian Institution discussing dental variation on a 3,000 year old mandible.

Nineteen burial mounds were excavated in 2007. In addition to six mounds completed in 2006, we have now excavated 25 mounds, of which 24 are Bronze Age (3,000 BP to 2,500 BP) and one from the Hunnu Period (2,500 BP to 1,900 BP). Of the Bronze Age mounds, ten have so far been dated to between 2,800 BP and 3,300 BP using traditional radiometric and accelerator mass spectrometry (AMS) procedures. The dates presented are tentative, however, and the final interpretation of the AMS dates will be presented when all 24 samples have been processed by the NSF-Arizona Accelerator Mass Spectrometry (AMS)

Laboratory in Tucson.

One of our objectives is to establish an evidence-based relationship between burial data obtained from the human remains and architectural and cultural data represented by mound construction and locality features. This research is still in progress with only a limited amount of data-processing completed. However, tentatively we have found evidence of correlations between variables including the geodetic location (coordinates) of the center of mounds, the directions of burial chambers, the number and quality of stones used in the construction, and variables such as landscape features, including slope distances, and the direction of the contours of the land. We have also found correlations between metric dimensions of mound features such as chamber length and mound and fence diameters and the sub-adult age at death. So far, no such correlations have been found between variables collected in mounds with adult-aged human remains. This may suggest that size variations found in adult burials are related to other factors including economic, social, and kinship data. This question still has to be explored. The task, however, is made difficult due to the complete lack of man-made burial objects associated with the burial structure and/or human remains.

We still have a long way to go, both in the collection of supplementary field data and particularly in the laboratory processing of data and information. The latter task has two objectives: (1) to create a database for the purpose of completing comprehensive publications of our research, and (2) to make field and laboratory data and information available on the World Wide Web as a series of interlinked, hypertext documents. However, at this time we are still working on analyzing and sorting raw data information which has proven very time consuming. This is especially true for the high

precision surveying data done with the Locus Ashtech/Magellan (static differential GPS) (see photo).

We have made interesting observations which have led to new hypotheses, presently being tested. To name a few, we are studying the effect of horse-riding on the human skeleton. Changes in the anatomical expression observed in the human pelvic bones from Medieval Period England and other populations can most likely be associated with horse-riding. Similar skeletal features have been found in our Bronze Age male skeletons from the Hovsgol aimag. However, such in-



Fig. 3: Tsend Amgalantugs (Tugsuu) holding Ashtech/Magellan Rover unit used in surveying Bronze Age burial mounds.

formation is preliminary and should be considered with caution until we have improved our sample size. This part of our research is being facilitated by collaborators using human skeletal collections from other regions in Mongolia representing contemporary and non-contemporary populations. We are also comparing data, associated with Bronze Age burial structures in Mongolia, with similar information derived from contemporary structures in other parts of the World. We have learned that variations in spatial distribution of Bronze Age mounds might have associations with sedentary or non-sedentary behavior or variations between these two extremes. We hope that such a model can be compared to our Mongolian survey data to help us answer questions related to nomadic vs. sedentary behavior in Mongolia 3,000 years ago.

As these plans move forward we are preparing for the 2008 field season in coordination with the Mongolian Academy of Sciences. Excavations to date are representative of a very small, but well defined area within the 850 square kilometers landscape which has been surveyed. We plan to excavate a few mound structures in at least two additional but different areas within the defined 850 square kilometer area. Currently we hypothesize that we will not find much variability between areas as pertinent to architecture, human remains, and/or dating. Also, our excavations have been focusing on mounds located in the southern hills and bordering the hill-sides. Those mounds are relatively small and are defined as Class III and Class II mounds, respectively. Mounds found on the flat steppe and identified as Class I mounds can be huge and would require at least one complete season of excavation in order to excavate a single mound. We hope to excavate a Class I mound in 2009. We also plan to expand our mound survey to areas south of the Delgermoron River and west of the present survey area. Improving on our survey data will significantly enhance our ability to calculate a better demographic profile of the people who constructed the mounds and also provide information on sedentary versus nomadic behavioral activities.

Support for our Mongolian research has come from many sources, including the National Geographic Society's Exploration Council grants no. yyyy (2006) and xxxxx (2007); the Human and Social Dynamics initiative of the National Science Foundation (USA), under grant no. BCS-0527471; the Department of Anthropology, National Museum of Natural History, the Smithsonian Institution; the Arctic Study Center, National Museum of Natural History, Smithsonian Institution; the Institute of Archaeology, Mongolian Academy of Sciences; Siemens Medical Solutions in Cary, North Carolina; and from private sources.

PART VII

Worship of Spirits in the Darkhat Valley, Northwest Mongolia

Paula DePriest, Museum Conservation Institute, Smithsonian Institution



Fig. 1 Consecrated horse belonging to lead guide Sanjim with a *seter* attached to its un-cut mane. The *seter* is a bundle of colored cloth ribbons that holds a spirit. This horse is called *Ongon Be*, Tuvan for mare. July 2005

Mongolian nomadic culture provides the appearance of continuity over thousands of miles and thousands of years. Ancient bronze-age inhabitants and modern Mongolians have at least a three thousand-year heritage of herding stock and pasture-use, hunting of forest animals, and use of sacred sites and practices. Ancient inhabitants constructed grand and lasting monuments such as Bronze Age khirigsuurs and deer stones and Turkic-era stone men ('balbal') and inscribed stones. Modern Mongolians, and their Asian, Central Asian, and Siberian relatives, have the ubiquitous *ovoo* – piles of stones or teepees of poles and sticks that are found on mountain passes, road crests, and difficult river crossings and headwa-

ters, honoring the spirit-masters of these places. These modern monuments change and grow with every passer-by who adds stones, sticks, and objects to the monument and performs the ritual of circling the *ovoo* three times in a clock-wise direction to ask for luck in his or her travel. However, it is not clear whether most modern Mongolians consider these *ovoo* rituals as tradition and superstition, or actual spirit worship.

There are other monuments, more important and sometimes more ephemeral, that are actively worshiped to this day. These honor spirits known as *ongons* and the sacred objects, also called *ongons*, where they reside. *Ongon* is applied equally to the "untouched" and uncut mane at the withers of all Mongolian ponies; to the bundles of cloth ribbons known as *seters* (Figure 1), stuffed cloth, or carved wood, bone or stone figures that hold spirits; to the fenced *asars* for the worship of dead shaman (Purev 2003); and to each community's shared sacred and ceremonial sites. Even some of the Bronze Age deer stones and Turkic stone men currently are venerated as *ongons* as is evidenced by their decoration with Buddhist prayer cloths, hadags, or anointment with yellow ointments, and by the remains of burned incense and animal scarifies at their base, all of which we have seen in recent years at the Ulaan Tolgoi (Erkhel) deer stone site (N49°55.922' E 099°48.227').

However, rather than continuity, these nomadic cultures actually represent cross-currents that intermix many cultures and different spiritual traditions and worship practices. In our recent years traveling in Hovsgol Aimag's Darkhat Valley and its surrounding Ulaan Taiga, the Deer Stone Proj-

ect's Botany Team has visited and documented a number of *ongons* and *ovoos*. These sacred objects and sites mix together folk religious practices and worship of fire, sky, earth, and water with Asian ancestor-worship, shamanism, and Buddhism. Heavenly deities and underworld spirits preside alongside numerous Buddhist gods in the three-world cosmology shared by modern Mongolian and their close neighbors, the Tuvans. One interesting remnant of the different religious traditions is a practical separation of worship functions. Individuals petition the disinterested heavenly deities; clan elders conduct ancestor worship ceremonies; and lamas guide Buddhist worship – but only the Shaman or Lama-Shaman negotiate, wrestle, and trick the underworld spirits. The Darkhat Valley's sacred objects and sites represent three separate but intertwining worship traditions in current practice – Lamist Buddhism, Darkhat Shamanism, and Dukha Shamanism.

Worship of Spirit-Masters of Places

Ovoos and outdoor *ongons* constructed of locally available stones, sticks, or trees allow communication with and offerings to the spirit-masters of places – mountains, forest, passes, rivers, and lakes. As Pegg (2001: 97-100) notes, Mongolians are “dwarfed by an inhospitable landscape” and must placate “truculent” master-spirits to ensure fertility, health, and wealth. These spirit-masters controlling all of the factors most important in herding represent an ancient folk tradition that has been incorporated into both Shamanism and Buddhism. The spirit-masters and their *ovoos*, *ongons*, and ceremonies are the domain of the clan and the clan elders, with a secondary role for their shaman and Buddhist lamas (Pedersen, undated). Any Darkhat, Dukha, or Mongolian traveling the Darkhat Valley is free to worship at its many *ovoos* and community *ongons*, and this worship is the most common observed by travelers in the region.

The Darkhat Valley, as the former Buddhist ecclesiastical estate Darkhat (or Dhakhad) Ih Shav' under the Jebtsundamba Khutuktu, is home to a number of Buddhist-influenced Darkhat *ovoos*. They are characterized by multicolored prayer scarves traditionally of Chinese silk (but now often of synthetic fabric), printed prayer flags with standard messages, wooden, seed, or stone prayer beads, and plaques with Tibetan script. The most important ceremonial sites, Öliin Davaa ('bald pass') at the southern entrance of the Darkhat Valley (N50°34.647' E 099°08.581') (Figure 2), Ongon Hill in Renchinlumbe Sum (N51°22.548' E 099°34.988') (Figure 3), and the sacred Renchinlumbe Mountain (N51°32.575' E 099°12.270') (Figure 4), each have thirteen *ovoos* or altars – twelve small *ovoos* or altars in a row with one large *ovoo* at the south end. The *ovoos* are constructed of standing sticks in a teepee form. The number of *ovoos* and offerings is part of the “Cult of Thirteen Altai Mountains of West Mongolia” (see explanation in Pegg 2001: 108-112, 304), a ritual number adopted by Buddhism as representing sacred Buddhist mountains.

Öliin Davaa and Ongon Hill are used annually for festivals and Naadams (the Mongolian festivals with horse raising, archery, and wrestling), and for ritual milk offerings before the fall



Fig. 2 Dukha guides in front of the large *ovoo* showing Lamist Buddhist and Darkhat Shamanist influences at Öliin Davaa ('bald pass'), the southern entrance of the Darkhat Valley. July 2007

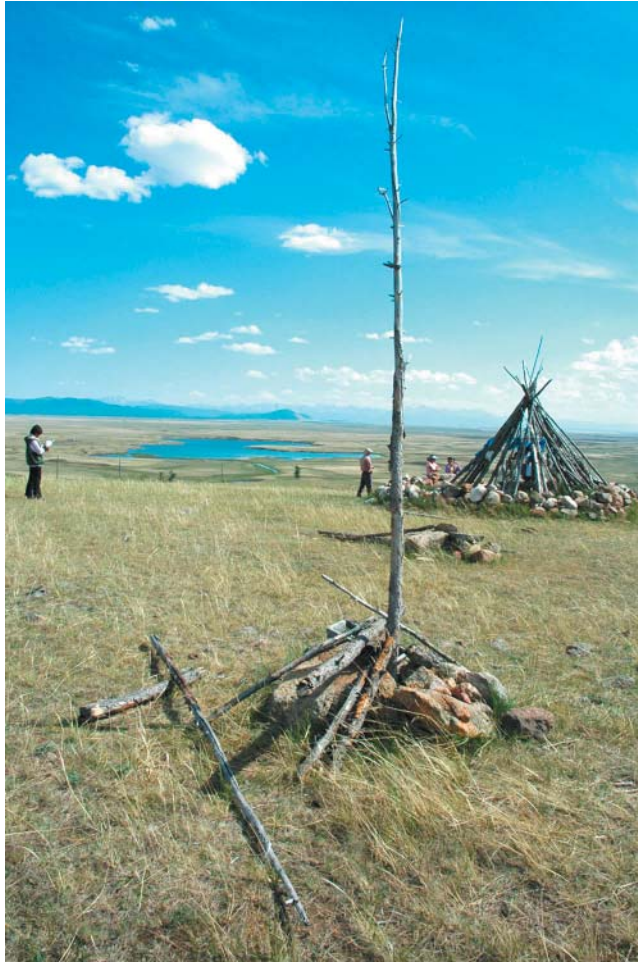


Fig. 3 Two of the twelve small ovoo altars, with the large ovoo in the background, showing Lamist Buddhist and Darkhat Shamanist influences at Ongon Hill in Renchinlumbe Sum. June 2005

migration (see Pedersen, no date: 21-23, for description of the Öliin Davaa festival). Renchinlumbe Mountain was used for reading of Buddhist sacred texts before Buddhism's suppression by the Communist government beginning in the 1930s. Buddhism has greatly influenced the ethnic Darkhats and their Shamanism, so their sacred sites are often shared with the Buddhists and decorated in a similar manner. In addition the Darkhats have "Shaman Trees," large, lone trees often marked as sacred by being struck by lightning. One Darkhat shaman tree in the Kharmai Valley (N51°20.451' E 099°14.693') is a lone pine tree decorated with blue and white prayer hadags on its lower branches (Figure 5). The related ethnic Buryats place the ashes of cremated shamans in deep holes cut into similar shaman trees (Humphrey 1983).

The Dukha represent a separate but related ethnic group maintaining a Tuvan primary language and shamanic practices that have to a lesser extent been influenced by Buddhism. The Dukha are traditionally reindeer-herders who also hunt and gather, in contrast to the Darkhats, who traditionally herd domestic sheep, goats, and cows. In contrast to the Buddhist and Darkhat traditions, Dukha (also called Tsaatan – meaning reindeer people in Mongolian) outdoor worship

sites are not obvious and focus on natural elements and use of natural materials such as "Russian cotton" fabric that readily decomposes. In June 2007 the Botany Team visited one Dukha *ovoo* which is treated as a sacred site by our Dukha guides (Figure 6) – we were not permitted to collect any of the plants observed around the site. The site was located on a rock outcrop on the highest point of a ridge above the Kharmai River west of Tsaagannur Sum, the same ridgeline with a Darkhat shaman tree and a Buddhist *ovoo* (N51°20.451' E 099°14.693'). Kharmai is known as the valley of the "fathers" or ancestors for its numerous ongons and shaman burial *asars* (see map in Purev 2003: 316, as "Harmay"). The Dukha *ovoo* consisted of two groups of three sticks each anchored with piles of rock on the top of a flat outcrop. The sticks were between 1 and 1.5 meters long; only one stick had branches.

The first activity of the Dukha guides when we arrived at the site was cleaning and repositioning the sticks that had fallen. Our Dukha guide Khalzan, a Dukha shaman, prepared ritual milk and cheese offerings, incense of *artz* (*Juniperus*) and other aromatic herbs, and, with the help of other guides, tore strips off of a meter-wide piece of white Russian cotton cloth. The guides offered milk to the heavens with a *tsatsal* — a traditional wooden spoon with nine small sockets representing the nine heavens that was ornamented with bundles of multicolored ribbons or seters — and called the names of numerous places, mountains, and rivers as they made one clockwise turn. When



Fig. 4 Deer Stone Project Botany Team with Dukha guides holding plaques with Tibetan script from the Lamist Buddhist ovoos on the sacred Renchinlhumbe Mountain in Renchinlbe Sum. July 2006

asked, lead guide Sanjim, the father of Khalzan, reported that he called the names of Tuvan places the country where he was born, in addition to places in the Darkhat Valley and Ulaan Taiga. The guides tied multiple 5cm-wide cotton strips to each of the sticks and placed small pieces of cheese around the altars. As a final ritual they, in turn, blew on incense burning on the altars to create a cleansing smoke. The ceremony, led and directed by the clan elder Sanjim, appealed to the spirit master of Kharmai for protection and provided instruction to the younger guides and family members on proper worship.

Worship of the Spirit-Masters of Animals

In addition to protection of the clan, Dukha and Darkhat shamanists use *ovoos* to ask for luck in hunting. Hunting represents an exchange with the spirit-masters of animals. A hunter or hunting group must win the permission of the spirit-master to take wild game. For the ethnic groups of the Darkhat Valley, along with their Siberian relatives, the interaction between the hunter and the spirit-master is seen as charming or seducing, and embodies all of the intimate and romantic qualities of human romance and marriage (see Willerslev 2007). Hamayon (2006) suggests that Siberian hunting cultures are of necessity shamanistic, with the exchange mediated between a male shaman and a female animal spirit-master convincing her to give up her animals. While we have not been privy to the shamanist negotiations, we have observed special worship by male Dukha hunters at one of the few active hunting *ovoos* in the mountains above the Darkhat Valley, the Sailag Davaa hunting *ovoo*.

In June-July 2005 and July 2007, our group visited the hunting *ovoo* at Sailag Davaa (N51°06.702' E 098°08.961') (Figure 7), over two days by horse from the closest reindeer camp or settlement. According to the Dukha guides, the hunting *ovoo* became important during Mongolian



Fig. 5 Darkhat shaman tree above the Kharmai Valley that is decorated with blue and white prayer hadags on its lower branches. June 2007

independence in 1911 when, under increasing Russian influence, the local groups paid tribute in fables hunted or trapped in the pass. To meet this tribute, large groups of hunters camped in the pass in the winter months, the hunting *artels* described by Vainstein (1980:174). This pass is the eastern entrance to the Bussingol Depression, since the late 1950s an uninhabited border region that is the primary hunting and antler-gathering ground for both the Dukha and the Darkhats. The *ovoo*, standing on a small hill in the center of the pass, is constructed of around 2.0-1.5 meter sticks anchored in a pile of rocks. The sticks are tied with as many as 300 strips of fabric in multiple colors; an estimated 80% of the strips are white Russian cotton, 10% blue, 5% yellow, and the remainder green, red, brown, pink, purple, and printed multicolor.

Attached to the sticks are over 60 carved *ongons*, almost all of wood. Half of these represent hunting equipment – knives (14), rifles that can be identified to make (10), spikes (2), bullets for particular rifle models (2), a club, and a crossbow arrow. The remainder include wild animals – rabbits (2), and bear, bird, deer, lynx, marmot, and squirrel; domestic animals – horses (5) and camel; commemorative plaques (13, including 10 that were produced during the July 2007 visit); and various items – skis (2), an airplane, a flour-mixer, and a vodka bottle. Actual objects include bullets (10), vodka bottles (3), ibex antlers (1 complete pair, 1 single antler), cigarette lighter (1), and numerous matches and match boxes. Interestingly, this *ovoo* has no horse or animal skulls, although they are common on *ovoo*s throughout the Darkhat Valley. The *ovoo* has two altars of flat rocks that are in current use for burning incense (documented in June 2005) and offerings of cheese and candy (June 2005, Figure 8, and July 2007). Milk offerings are made to the surrounding mountains and rivers and to animate the *ongons* and antlers on the *ovoo*. As with tools attached to Dukha and Darkhat shaman garments, the small weapons and animals serve as amulets as the hunter negotiates with the animal spirit master for good hunting. Animal figures are used to ask for exchange for actual animals, and to serve as repositories (*ongons*) for holding the spirits released from his earlier catches.

The released spirits are then ready for rebirth under the control of their spirit-master.



Fig. 6 Dukha Shamanist *ovoo* above the Kharmai Valley that the Dukha guides are decorating with strips of white Russian cotton fabric. June 2007

Worship of Ancestors

The most important *ongons* are family objects that contain spirits and human souls, often of deceased shamans and other relatives. As discussed by Banzarov as early as 1891 (summarized in English in Znamenski 2003), such *ongons* for ancestor worship may have originated from widespread Asian ancestor worship. Rychkov in 1922 (in Znamenski 2003) suggested that these souls are considered dangerous as they may try to take their family, and especially the children, to the underworld to create a parallel life. Additionally, Hamayon (2006) noted that in Turkic cultures such as the Tuvan Dukha where souls are reused (reincarnated), the souls of relatives who die without progeny and therefore are without the potential for being reincarnated in descendants may take over a living body by displacing its soul. Providing a figure or image (Smoliak 1991) to hold the souls, feeding them with milk or fat, keeping them in a



Fig. 7 Dukha and Darkhat Shamanist hunting ovoo with carved images of weapons and animals at Sailag Davaa, with a rainbow. Rainbows are considered both *ongons* and good omens for these ethnic groups. June 2007

secure place in the home (*ortz* or *ger*) and honoring them has the goal of appeasing and taming the spirits and holding them in a safe place. In Buddhist and Darkhat homes the family will have an altar with special candles, ancestor or family photographs, and Buddhist tankas, visible to all. In contrast, Dukha shamanists keep their altars, including photographs of deceased family members, covered and their family *ongons* are enclosed in a pouch they hang from the roof poles of their tents. The *ongons* are produced and animated by shaman and, if the family has enough wealth to set aside animals permanently from routine work or slaughter, are transported during migrations on consecrated

domestic animals, horses, reindeers, sheep, goats, or cows (Vainstein 1996).

In June 2007 we were allowed to view a display of the *ongons* belonging to guide and shaman Khalzan and his family (Figure 9). Khalzan reported that the *ongon* was very old, belonging to the Soyon clan of his mother, Chuluu, the wife of lead guide Sanjim. Chuluu's family has generations of shamans, and both her mother and father, Khalzan's grandmother and grandfather, were shamans. His grandfather's photograph in his shaman costume is displayed in the Mongolian National Museum. This clan is originally from the area near Mongolia's Ulaan Taiga and the bordering region of Tuva near Lake Tere-Khol. The *ongon*, actually five *ongons* attached to a single cloth, was presented to Khalzan along with other shaman paraphernalia from his ancestors. When he is older, at forty, he will have an additional seven *ongons* from his father's, Sanjim's, Baglash clan. The Baglash is from the Bei Khem area of northeastern Tuva.

The *ongon*, displayed at the north side of the *ortz* teepee was framed with numerous Buddhist hadags mainly in blue, but also a few in gold. The *ongon* was a pieced cloth, green above and white below with a blue strip between them, on which five small anthropomorphic figures were placed. The figures were dressed in high-necked blue *dels* with matching blue trousers and a contrasting yellow sash, all appearing to be constructed of wool felt. The feet, hands, and heads were



Fig. 8 Dukha guide, Bayaara, makes an offering of cheese and burned incense at the hunting ovoo at Sailag Davaa. June 2005

puffs of long, dark fur that may be bear or sable. At the feet of each figure were seter-like stacks of fabric strips (ca. 5 cm wide) that were white, with green, blue, and yellow strips below. Along the side of the *ongon* panel and on its ties hung bundles of fabric strips that are white, blue, yellow, green, and even a few prints of green and white. Bundles of dark horse hair were attached to some of the white fabric strips.

A number of other ritual items were displayed with the *ongons*. To the right of the *ongon*, a shaman's ritual walking stick with three branches at top was tucked under an *ortz* pole. With it was a grayed and crinkled cloth – apparently originally white – that must be its wrapping. Further to the right of the *ongons* were bundles of fur that may be a ritual bear paws and Khalzan's shaman drum and paraphernalia. Above the *ongons* was an embroidered image of a reindeer stitched in dark reddish brown thread on a white cloth edged in green. Ritual reins – white fabric covered in black, white, or red strips – may indicate the presence a second walking stick to the left of the *ongon*. Groups of fabric braids in white, green, and blue are ritual snakes. An old wooden pipe was displayed in front of the *ongon*. Offerings in front of the *ongon* included artz, cheese, cookies, candies, milk tea, candles of yellow oil, bricks of tea, and folded white Russian cotton cloth. The entire *ongon* display was splattered with milk, and during the viewing Khalzan used a *Tsatsal* to splatter the *ongon* with milk saying that he heard a raven, which is considered to be a shaman's messenger.

The *ongon* is consistent with a special type of Tuvan ancestor *ongon* (in Tuvan *eeren* or *eren*), *Emegelchin eeren* illustrated in Kenin-Lopsan (1997: plate 3) and described, as *emegel'chi eeren* by Vainstein (1996: 173) for protecting women during childbirth, and the family's home and possessions. Other types of contemporary family *ongon* have been described or photographed by Pedersen (undated: 9) and Sadar (2004), respectively. Although Vainstein (1996: 173) discusses the figures as representing 1) an ancestral female shaman, 2) the woman requesting the *ongon*, and 3) the woman's children, none of the five figures seem to have a drum or other ritual items indicating a shaman or to be smaller in size, representing children. Possessing and worshiping an *Emegelchin eeren* is consistent with the family's stated concern with protecting their children. When Khalzan was asked why there were so many shamans in his Soyon clan, he answered that they were needed to protect their children. With this *ongon* the family is honoring the souls of their ancestor who domesticated their reindeer, asking for the ancestor's protection from hostile spirits, and with shamanic magic keeping them from either steal or replacing the souls of the family members. Such *ongons* are produced by shamans and are used in their healing ceremonies.

To this day *ovoo* and *ongon* worship is active in the Darkhat Valley of northern Mongolia. In these sacred sites and with these sacred objects, the Dukha and Darkhats venerate the spirit-masters of specific places and of hunted animals, and most importantly their own ancestors. They lure spirits to reside in the objects to appease them into providing protection and good fortune and to act as their



Fig. 9 Dukha Shamanist Emegelchin eeren for ancestor worship with five anthropomorphic figures, belonging to guide and shaman Khalzan and his family. June 2007

special helpers in their day-to-day activities. Although these worship practices represent, and incorporate, different worship traditions — Lamist Buddhism, Darkhat Shamanism, and Dukha Shamanism — they share many common and ancient beliefs in the transport of souls between the earthly world, the heavens, and the under world, and the control of the earthly world by spirit- masters.

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PART VIII

Progress Report on the 2004 Memorandum of Understanding
on Scientific Co-operation between
The Mongolian Academy of Sciences (MAS)
The National Museum of Mongolian History
The Smithsonian Institution of the USA



Smithsonian Institution
22 October 2007

The following is a progress report on the research that Smithsonian scientists have conducted since the signing of the above mentioned MOU in 2004 in co-operation with their colleagues at the Mongolian Academy of Sciences (MAS) and the National Museum of Mongolian History.

I. Laser-Scanning and Documentation of Mongolia's Deer Stones

Harriet F. (Rae) Beaubien, Museum Conservation Institute

Conservators from the Smithsonian's Museum Conservation Institute (MCI) have participated in the Deer Stone Project's field seasons in Mongolia since 2004. There are two components, as described below.

Documentation

Documentation activities – featuring the use of 3D scanning technology – have been carried out during the 2005, 2006 and 2007 field seasons, and are producing records that will become part of a national registry of these important and threatened monuments. MCI's efforts have been supported by funding from the Smithsonian Institution (including a grant from the Office of the Under Secretary of Science) and the Samuel H. Kress Foundation.

Results:

3D digital files, produced for 40 deer stones at 9 sites, as follows:



R. Beaubien (right) and L. Weber scan deer stone #2 at the site of Ushkiin Uver at night. Darkness increases the pattern definition of the structured light the scanner projects. (photo: V. Karas 2006)

- 5 – site of Ulaan Tolgoi [2005, 2006]
- 3 – site of Khushuugiin Dev (Erkhel East 1) [2005, 2007]
- 2 – site of Erkhel North 1 [2005]
- 1 – site of Evdt Valley 1 [2005]
- 14 (including 1 in 3 pieces) plus fragments of 3 – site of Ushkiin Uver [2006]
- 1 (in 2 pieces) from Ushkiin Uver – Hovsgol Museum, Muren [2007]
- 4 (including 1 in 2 pieces) – site of Avtiin [2007]
- 2 – site of Hort Uzuur [2007]
- 4 – site of Khyadag west group [2007]
- 1 – site of Khyadag east group [2007]

In addition to the files, 3D models and other graphic products are being produced experimentally, using 3D digital files for Ushkiin Uver DS #14 and Ulaan Tolgoi DS #5. Supplementing these records are photographs and condition notes for the deer stones listed above. Systematic photographs have also been taken at a variety of other sites, including Khanuy Valley KYR 119 (Arkhangai aimag), Tsatstain Khoshuu, Olziyt, Khushuutii Am and Burdnii Ekh.

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Archaeological Conservation

Issues and techniques in the preservation of the material record, from the field to the museum, have been the subject of training seminars, offered by Beaubien and others, as part of the annual symposia organized by the Deer Stone Project, as well as in consultations with conservation colleagues at the Cultural Heritage Center, during the 2004, 2005, 2006 and 2007 field seasons. In addition, MCI conservators have provided hands-on conservation assistance with freshly excavated material during the field seasons of both the Deer Stone Project and the Khanuy Valley Archaeological Project (2005, 2006).

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II. Botanical and Cultural Explorations in the West Darkhad Taiga

Paula DePriest, Museum Conservation Institute

Project Summary

In the past several years the Smithsonian-Mongolian Deer Stone Project's botany team led by **Paula DePriest** and including American botanist **Steve Young** and Smithsonian staff **Deborah Bell**, **Sue Lutz**, and **Gregory McKee**, with Mongolian members

O. Sukbaatar, **J. Oyumaa**, **J. Oyunbileg**, and **Ts. Tsendeehuu**, has explored the territories of the Mongolian Tsaatan, ethnic Tuvan reindeer herders living around the northern Darkhat Valley of Hovsgol Aimag in northern Mongolia. These territories include hunting grounds, plant-gathering places, and traditional, but now abandoned, reindeer seasonal pastures up to 100 km from the Tsaagannur, Ulaan Uul, and Renchinlkhumbé sum centers.



*Salag Davaa hunting ovoo in its impressive setting
(photo: P. DePriest)*

The most notable destinations west of the Darkhat Valley and the West Taiga reindeer camps have included the extraordinary Salag Davaa hunting ovoo (N51°06.702' E 098°08.961') with over 60 carved images of knives, rifles, and animals dedicated to ceremonially requesting good fortune in hunting. The ovoo, visited with Tsaatan herders in 2005 and 2007, was initially established to ritually facilitate sable hunting after Mongolia's independence in the early 1910s and is maintained still by Dukha and Darkhat hunters traveling through the pass on their

way to the Bussingol Depression. In 2005 the botany team continued on through the Salag Davaa to the Bussingol Depression along the Tuvan border (N51°10.169' E 097°55.169'). The Depression is the spiritual homeland and burial grounds for Soyon clan shamans and, before the re-drawing of the border in the late 1950s, was part of their annual reindeer migration. Now, fifty years after closing of that border and the cessation of herding in the valley, the Bussingol Depression shows ecological succession with increase shrubs and trees and reduced grass steppe and provides an important comparison for studies of Darkhat pasture health.

In 2006, the botany team traveled far north of the Darkhat Valley and the Shishged Gol to abandoned reindeer summer pastures along the Russian border (N51°55.873' E 099°23.482') just beyond the 30-meter Orton Hyyarh waterfall (N51°54.229' E 099°21.685'). These East Taiga camps were reached via the historic Tengis Gol (N51°28.926' E 099°03.007') with its Chinggis Rock and Fence (N51°28.808' E 099°03.050') reported to have been constructed during the Chinggis Khan era. Chinggis Khan (more likely his son Joci) is reported to have visited the confluence of the Tengis and Shishhid Gols to accept the peaceful surrender of the People of the Forest in 1207/08 leaving legendary footprints and a fence of stacked stones. The Tengis Gol is a doubly important site for Mongolians as legend claims that the Mongol clan originated from a blue-grey wolf and a fallow doe along a body of water named 'Tenggis.'

The team, with Tsaatan guide Sanjim and his sons Khalzan, Batmonkh, and Bayanaa of the West Taiga Dukha, conducts plant community reconnaissance and collects representative vascular plants and lichens with special emphasis on those used by the Dukha as pasture for reindeer or as medicinal plants. For example, in 2004 the team traveled along the Jams and Joloc Rivers to find the only reported Mongolian locations for Siberian fir (*Abies sibirica*) that was used as a healing plant by Dukha Shaman Suyan, now deceased, and in 2006 to the Buddhist sacred site Renchinlkhumbe Mountain (N51°32.575' E 099°12.270') to find the traditional Mongolian medicinal plant sawwort – *Saussurea* sp. To date, hundreds of plant collections accumulated during the project have been accessioned in herbaria of the Mongolian Academy of Sciences, the Mongolian National Museum and the university at Moron, in addition to the Smithsonian Institution.



Bayanaa collecting specimens for further analysis
(photo: P. Depriest 2007)

In addition, the group has visited and documented sacred sites — ovoos and ongons — and conducted ethnographic and ethnobotanical observations of Dukha traditional and religious practices. In 2007, the team visited and documented worship at Buddhist, Darkhat, and Dukha ongons (N51°20.451' E 099°14.693') and visited a Darkhat Shaman's *Asar* field ongon (N51°19.955' E 099°17.675') above the Harmay Valley west of Tsaagannur Soum Center. Most notably, the team observed and documented the guides' ancestor ongons, in their Tuvan language called *Ereen*, displayed inside their ortz (teepee). During the same field season, the botany team attended Tsaagannur Sum's first Tsaatan Festival. The Festival included a traditional horse race, reindeer race, a reindeer polo match, talent competition, and a Darkhat shaman's show. One unique element was the demonstration of traditional birch-bark covering for an ortz prepared by the team's guides. Birch bark was

routinely used on ortz as a summer cover before the 1970s import of canvas, which was overseen by botany team member O. Sukhbaatar.

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III. Smithsonian Festival: *Chinggis Khan: 800 Years of Mongolian Statehood*

William W. Fitzhugh, Arctic Studies Center/Dept. of Anthropology, NMNH

Project Summary

At the request of Mongolian Ambassador Bold, the Smithsonian organized a cultural festival titled *Chinggis Khan: 800 Years of Mongolian Statehood* from 6-8 October 2006. The festival commemorated the anniversary of Mongolia's long history as a nation, founded by Genghis Khan in 1206, and highlighted Mongolian history, arts, science, and performance.

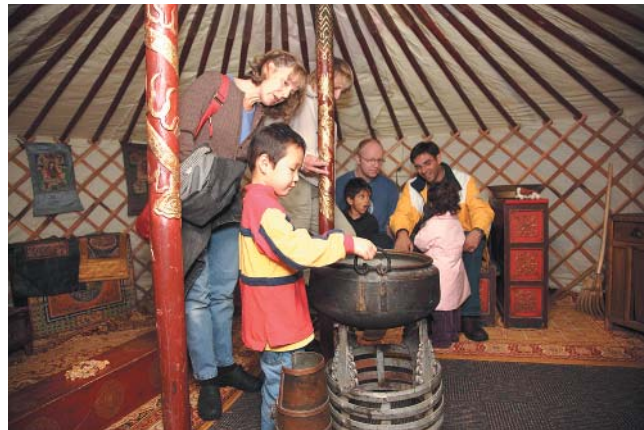
The festival included a symposium at the Woodrow Wilson Center

for Scholars titled *Mongolia Matters: the Legacy of Chinggis Khan and Mongolia's Great Empire* organized by Alicia Campi.



The Mongolian Festival performances held in the NMNH Baird Auditorium were exuberant displays of the breadth of Mongolian arts and culture (SI photo)

Smithsonian presentations included an evening of dance and music by Mongolian performers and a spectacular historical and modern costume fashion show, *The Great Story of the Mongols*, produced by Mongolian artist and impresario, Gankhuyag Natsag, and the Smithsonian Resident Associates. The National Geographic Society prepared exhibitions of Mongolian photography by photographer Gordon Wiltsie, as well as native Mongolian photographers, for the halls of the National Museum of Natural History. In addition, there were musical performances, acrobatics, story-telling by local Mongolian children, and a reconstruction of a traditional Mongolian *ger*. Recent Smithsonian deer stone research and laser-scanning documentation and demonstrations of felt-making were also presented. The three-day event had spectacular results and drew large crowds to the museum and its evening events. The project was publicized by local media and by a special issue of the *Arctic Studies Center Newsletter*. One testament to the success of the Mongolian Festival was the Washington media 'buzz' about the need to erect a statue in downtown Washington, DC to honor the achievements of Genghis Khan!



A young visitor to the Mongolia Festival exploring the interior of a ger (SI photo)

The Mongolia Festival would not have been possible without the support of the following groups and individuals: the Embassy of Mongolia; the Smithsonian Resident Associates; National Museum of Natural History; SI Museum Conservation Institute; The Mongolia Society; American Center for Mongolian Studies; National Geographic Society; Gordon Wiltsie; Ed Nef; Ed Story and Soco Oil; Alicia Campi and many others who made this event into a great success.

Publications

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IV. The Smithsonian-Mongolian Deer Stone Project

William W. Fitzhugh, Arctic Studies Center/Dept. of Anthropology, NMNH

Project Summary

Since 2001 the Smithsonian's Arctic Studies Center has directed a multi-disciplinary research and cultural heritage and preservation project in Mongolia. Originally dedicated to exploring the archaeology of Mongolia's Bronze Age cultures and contemporary Tsaatan (Dukha) reindeer-herders of the Darkhad region of northern Mongolia, the project has expanded to include related research in botany, physical anthropology, paleoenvironmental studies, and ethnographic studies of Darkhad and Tsaatan cultures. Many of these projects are described elsewhere in this document, so I shall describe here only the activities relating to studies of deer stone art and Bronze Age ceremonialism.



Deer stone at Erkhel Ulaan Tolgoi site (photo: ASC 2002)

has demonstrated deer stones date to a very narrow chronological period fully one thousand years older, from 3200-2800 years ago. They are therefore several hundred years earlier than the earliest Scythian sites, like Arzhan, which dates to 2600-2700 years ago. Furthermore, we believe that our research will demonstrate that the earliest deer stones originated in northern Mongolia and spread westward into Russia and Kazakhstan, and from there spread to the Black Sea as part of Scythian culture, where it was first described historically by Herodotus in the 5th century B.C.

We have also demonstrated that deer stones are contemporaneous with another major Bronze Age archaeological expression: the khirigsuur burial complex. This complex was also thought to be a later development, independent of deer stones. However, many radiocarbon dates and excavations prove that both are part of a single mortuary ritual tradition that included burial of many if not most of the members of this early horse-using society, ranging from small simple khirigsuurs to huge mounds accompanied by hundreds and even in some instances, thousands, of horse sacrifices. Both deer stones and khirigsuurs are surrounded by horse

Deer stones, among the most beautiful and earliest examples of Mongolia's ancient past, have become an iconic symbol of the country's rich heritage. Many consider deer stones to be some of the finest examples of ancient monumental art in the world, and there has been speculation this art was instrumental in the formation of Scythian art and culture, and even of ancient Eskimo art and culture in the Bering Sea. However, because deer stones had never been dated by archaeological methods, their origin was speculative but was estimated at ca. 2000 years old.

Our work over the past five years, in collaboration with the National Museum of Mongolian History,



Excavations in process at the Erkhel Ulaan Tolgoi site (photo: ASC 2002)

burials and family feasting sites dating to the same time periods.

Recognition of our results has been presented in scholarly papers and popular media. Our results have also appeared on websites and in special exhibits at the Smithsonian's National Museum of Natural History, which displayed a cast of a Mongolian deer stone from the Ushkin Uver site near Muren, Hovsgol aimag. We also provided a cast to the National Museum of Mongolian History for its displays, and the NMMH has sent this cast on display to foreign exhibitions in Europe. The NMNH in 2003 also hosted a major exhibition titled, *Modern Mongolia: Reclaiming Genghis Khan*, prepared by the University of Pennsylvania and the National Museum of Mongolian History.

Museum Training and Conservation Seminars

Each year the Smithsonian Deer Stone Project has organized a scholarly symposium and museum studies workshop in Ulaanbaatar as part of its yearly research program. These seminars have attracted large numbers of Mongolian scholars, media professionals, museum specialists, and conservators. The proceedings have been published in English and Mongolian with assistance from the US Department of State Ambassador's Fund. The yearly events have been organized by the American Center for Mongolia Studies and the National Museum of Mongolian History. Museum studies workshops have presented the latest techniques in object and paper conservation, preventative conservation, exhibit preparation, casting, laser scanning, and precision GPS mapping to students and professionals alike.

Deer Stone project research, training, and public programs have been made possible by generous grants and assistance from: Trust for Mutual Understanding; National Geographic Society; Arctic Studies Center; the Smithsonian's National Museum of Natural History Office of Exhibits Central and Museum Conservation Institute; the Department of State Ambassador's Fund; InlingualDc, and many private donors.

Publications

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V. Forensic Studies of Ancient and Modern Mongolians

Bruno Frohlich, Department of Anthropology, NMNH

Introduction

Since 2004 Bruno Frohlich and his associates have collaborated with the Institute of Archaeology at the Mongolian Academy of Sciences on several archaeological and anthropological projects in Mongolia and in the US. This includes surveying and excavations of 3,000 year-old Bronze Age burial mounds, also known as khirigsuurs in the Hovsgol aimag, the study of 300 to 400 year old human mummified bodies from the Gobi Desert, the forensic investigation of executed Buddhist monks found in mass burials at Hambiin Ovoo outside Ulaanbaatar, and the sponsoring of extensive training of Mongolian students and researchers at the Mongolian Academy of Sciences.



Bruno Frohlich supervising excavations at a small Bronze Age burial mound in Mongolia. (SI photo)

Hovsgol Burial Mounds

The major goal is to study and understand the temporal and spatial distributions of northern Mongolia's Bronze Age burial mounds and how such information can in turn help us better understand the people living in the Mongolian steppe landscape 3,000 years ago. Our project is divided into three phases: (1) surveying; (2) excavations; and (3) analysis. Phase 1 took place from 2003 to 2005, during which we completed the survey of more than 1300 mound structures in an 850 square kilometer area between Ushkiin Uuver and Ulan Tolgoi

west and northwest of Muron. This information has now been included in an advanced and informative geographical information system (GIS). Phase 2 was initiated in 2006 with the excavation of seven mounds all yielding human skeletal remains and which all dated to about 3,000 BP. Phase 2 continued in the summer of 2007 and resulted in the excavation of 15 additional mounds, all yielding human remains. Phase 3, the analytical stage, is in progress including the quantitative analysis of surveying data (GIS), and the study of mound architecture and the human remains. We expect to complete Phase 2 (excavation) next summer (2008). At this time, we believe the the Khirigsuurs are indeed human burials and that they are representative of the people responsible for their construction. Hopefully our continuing research will enlighten us on many unanswered questions including the degree of nomadic and sedentary behavior.

Gobi Desert Human Mummified Remains

In 2004 we collaborated with the Mongolian Academy of Sciences in the retrieval of nine human mummified bodies from an underground cave in the southern Gobi Desert. The bodies, males and

females, including three infants, two children and four adults, were studied at the Smithsonian Institution for one year and then returned to the Institute of Archaeology in the summer of 2006. At this time we have completed radiological procedures, biochemical sampling for dating, and nutritional analysis, and are presently completing the pathological analysis of all nine bodies. We anticipate that our combined research will result in the reconstruction of the event that led to the depositing of these bodies into the cave more than 300 years ago. We have concluded that all nine individuals were murdered by execution-style killings including strangulation, hanging, dismembering of extremities, and the fracturing of several bones.

Mass Burials at Hambiin Ovoo

In the fall of 2003 we were asked by the Mongolian Academy of Sciences to assist the Institute of Archaeology carrying out forensic investigations of a recently found mass burial outside Ulaanbaatar. The mass burial had been excavated and researched by monks from the Ghandar monastery in UB. A small team of forensic experts from the Smithsonian Institution supported by staff members from the Institute of Archaeology completed test excavations in places surrounding the area where almost 1000 executed monks had been identified by the Ghandan monastery. About 50 bodies were studied, and supporting data and information have been produced in an attempt to describe and reconstruct the event from a forensic point of view. At this time, we have concluded that the mass burial is far more extensive than previous anticipated and that the time span in which this specific place was used for executions may have been several decades before and after the initial dating to the late 1930s. Ballistic analysis of cartridges found in the excavated areas, and the study of the entry and exit foramina in the crania have helped identify the kind of ammunition and types of firearms used in the majority of the executions. The final report of our initial investigation is presently being prepared for publication. Because of the potential political sensitivity of this research we are collaborating fully with the Mongolian Academy of Sciences on the publication of our finds.

Training and Education

Our collaboration with both the Mongolian Academy of Sciences and the National Museum of Mongolian History has resulted in an expanded access to advanced analytical methods. This has included the evaluation and dating of human remains and advice on the interpretation of new finds. For example the recent find of a potential early hominid cranial calotte from Salkhiit in the Khentii aimag was brought to our attention last December by the Institute of Archaeology. We assisted the Institute in an early evaluation of the site, the finds, and also concluded the AMS/C-14 dating of potentially associated faunal remains. However, the most satisfying element of our collaboration is our interaction with Mongolian students and researchers. We are continuously involved in the exchange of ideas, data, and information. We are focusing on long-term plans, which include analytical procedures, teaching new research methods to students, and assisting in the planning of graduate studies both in Mongolia and in the US. We have been especially satisfied by the significant impact our sponsored English language training has had on improving students' and researchers' language skills. This training is ongoing and this fall we anticipate that about five persons from the Institute of Archaeology will be enlisted in this English language program.

Our collaboration with the Mongolian Academy of Sciences has proven to be very successful and productive. We are collaborating with our Mongolian colleagues, as well as with many scientists and organizations in the US and other countries. This includes the Deer Stone Project at the Smithsonian Institution, the University of Copenhagen, Emory University in Atlanta, Johns Hopkins University in Baltimore, New Haven University and Yale University in Connecticut, Auckland University in

New Zealand, and Bradford University in England. We anticipate our collaborative research with the Mongolian Academy of Sciences will become much more productive in the future, and we are especially encouraged by the ongoing success we have observed in the educational progression of most of our Mongolian students and degree candidates.

Publications

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VI. Archaeology of Ancient Nomadic Political Organization in Mongolia

William Honeychurch, Dept. of Anthropology, NMNH (Yale University)

Project Summary

My research in Mongolia has been directed at ancient nomadic political organization. Nomadic groups of the Eurasian steppe organized large-scale states and empires as early as the first millen-

nium B.C. and are best known for the world empire constructed by the medieval Mongols under Genghis Khan. How and why relatively obscure groups of pastoral nomads assembled such monumental and complex polities is a topic that archaeology is well-suited to explore.

I study these questions through the archaeological material remains left by horse nomads over the past 3000 years on the steppes of Mongolia. My field projects emphasize regional survey to discover and map cemeteries, habitation sites, walled fortresses, rock art, and ceremonial areas. Field surveys carried out to date are located at the site of Egiin Gol, northern Mongolia, and at Baga Gazaryn Chuluu in the Mongolian Gobi desert.



William Honeychurch oversees an excavation in the Baga Gazaryn Chuluu site in the Gobi desert (SI photo 2007)

For the past four years this research has been conducted as part of the Smithsonian's Mongolian Studies Program in collaboration with the Mongolian Academy of Sciences and its Institute of Archaeology.

Publications

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“stepped” approach to spatial data from a Mongolian river valley.” *Journal of Field Archaeology*

VII. Tracking Gazelle Movements Across Mongolia’s Eastern Steppes

Peter Leimgruber, National Zoological Park

Thomas Mueller, National Zoological Park

Project Summary

Scientists from the Smithsonian Institution’s National Zoological Park are investigating movements of Mongolian gazelles in Mongolia’s Eastern Steppes. This work has been performed in collaboration with the Wildlife Conservation Society (WCS) and the Mongolian Academy of Science. The Eastern Steppes constitute one of the largest remaining grassland in the world, even larger than the Serengeti, and support a diverse wildlife community. Perhaps most stunning are the huge groups of Mongolian gazelles –tens of thousands can be observed wandering across the steppe. However, these steppes are increasingly threatened by expanding industrial development, hunting, and hay production.

Using satellite-tracking, we have found that gazelles move over huge distances with a single individual requiring an area three times the size of Yellowstone National Park in a single year. However, unlike wildebeest in the Serengeti or caribou in Alaska, Mongolian gazelles do not move along well-established seasonal routes from known winter to summer grounds but are constantly wandering across the steppe in seemingly random ways.



Gazelles wandering across the steppes of Western Mongolia. (photo: T. Mueller)

To understand why animals pursue this unique nomadic strategy we have used satellite imagery to map grassland quality and productivity at regular intervals through the year. We have established a tight link between vegetation productivity and gazelle movements and have developed a predictive model that determines good gazelle habitat for any particular time. By applying this model to map good gazelle habitats of the past 7-8 years, we found that good foraging areas for gazelle constantly shift and that these dynamic shifts are unpredictable instead of regular and seasonal. That’s why suitable gazelle areas may sometimes be located inside protected areas, but at other times they may only be found outside park boundaries. Developing landscape-level strategies pertaining to the entire steppe rather than single protected areas will be key to effectively conserving Mongolian gazelles.

During our September 2007 trip to Mongolia, National Zoo scientists and WCS staff captured nine Mongolian gazelles and equipped them with GPS-satellite collars. Data transmitted from these collars will reveal how and why these gazelles follow this unique movement pattern. On our trip we observed the largest congregation of Mongolian gazelles ever reported. Over 200,000 animals were roaming the grasslands. We also witnessed immediate threats to their steppe habitat, including large-scale oil exploitation and new road construction.

Publications

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Larson, 2001. "Spatial patterns in relative primary productivity and gazelle migration in the Eastern Steppes of Mongolia." *Biological Conservation* 102: 205-212.

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"Reproduction, neonatal weights, and first-year survival of Mongolian gazelles (*Procapra gutturosa*)." *Journal of Zoology* 265: 227-233.

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Mueller T., K.A. Olson, T.K. Fuller, G.B. Schaller, M.G. Murray, and P. Leimgruber,

2007. "In search of forage: predicting dynamic habitats of Mongolian gazelles using satellite-based estimates of vegetation productivity." *Journal of Applied Ecology* doi: 10.1111/j.1365-2664.2007.01371.x

VIII. Urban Centers and the Emergence of Empires in Eastern Inner Asia

Daniel Rogers, Dept. of Anthropology, NMNH

Project Summary

This project, which began in 2002, investigates the emergence of urban centers and empires in Mongolia and adjacent regions of Eastern Inner Asia. In addition to Daniel Rogers (Smithsonian Institution), project partners include Erdenebat Ulambayar (Mongolian Institute of Archaeology), and L. Monkhubayar (Mongolian Institute of Archaeology).

The focus of the project is on archaeological study of the role of settlements in the development of empires in Mongolia, beginning with the Hunnu empire (200 B.C.) and continuing through the Mongol empire. Field work has involved broad regional surveys, visits to major urban centers of the different cultural periods, studies of early maps and plans, consideration of ecological variables, and historical documents as well as published literature.

These studies have enabled us to better understand the inner mechanisms of Mongolian empires. The large political confederations of high mobility which traditionally characterize the great Mongol empires of the first and second millennia A.D. are shown to have made use of highly sophisticated urban places, which feature advanced planning and design, and impressive monumentality serving a variety of specific functions. Research continues on these and related projects, including a large multi-institutional research grant from the National Science Foundation (NSF) involving agent-based modeling of cultural change through time using data collected in the field programs described above, and in more detail below.



D. Rogers, T. Ulambayar, and E. Bunkhubayar consult on the correct route to the Chingissid Wall in eastern Mongolia.

Publications or reports citations

Rogers, J.D., E. Ulambayar, and M. Gallon, 2005. "Urban centers and the emergence of empires in Eastern Inner Asia." *Antiquity* 79: 1-18.

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IX. Agent-Based Dynamics of Social Complexity: Modeling Adaptive Behavior and Long-Term Change in Inner Asia

Daniel Rogers, Dept. of Anthropology, NMNH



The stupa at Kherlem Bars City #1 is approximately 1,000 years old, making it a very important treasure of Mongolian history (SI photo)

Project Summary

This long-term National Science Foundation (NSF) research grant began in January 2006 and will continue until January 2009, with partners including: (1) C. Cioffi-Revilla (Principal Investigator), S. Luke, and D. C. Parker of George Mason University, Fairfax, VA, U.S.A.; (2) J. D. Rogers, W. W. Fitzhugh, W. Honeychurch, B. Frohlich, and P. DePriest, of the Smithsonian Institution, National Museum of Natural History, Washington, DC, U.S.A.; (3) C. Amartuvshin, of the Mongolian Academy of Sciences, Ulan Bataar, Mongolia; Malkov, of the M. V. Keldish Institute for Applied Mathematics, Moscow, Russia; and (4) Domenico Parisi, Inst. of Psychology, Italian National Research Council (C.N.R.), Rome, Italy.

The project addresses fundamental questions in theory, methodology, and data concerning human and social dynamic responses to social and environmental challenges in Inner Asia and the Eurasian world system over the past 4,500 years. Inner Asia played an essential catalytic role in the history of human and social dynamics in Eurasia. This system produced the largest territorial polity to emerge in the evolution of civilizations – the Mongol Empire of the 13th and 14th centuries – as well as the largest scale economy – the Silk Road network – before present-day globalization.

For each of the last two years, three archaeological teams have been in Mongolia under Smithsonian sponsorship, through collaborations with the Institute of Archaeology and the National Museum of Mongolian History. The fieldwork has produced many new discoveries, especially on Bronze Age deer stones and burial mounds and systematic recording of archaeological sites in several regions. Work is also ongoing with the Institute of Archaeology to produce a database of archaeological sites in Mongolia.

A computational model of social change has been produced that focuses on the development of early

tribal confederations and how clans and lineages may have merged to form more complex societies.

Publications or Report Citations

Numerous publications have been produced in archaeology and computational social science. Selected examples are listed below:

Cioffi-Revilla, C., S. Luke, D.C. Parker, J.D. Rogers, W.W. Fitzhugh, W. Honeychurch, B. Frohlich, P. DePriest, and N. Bazarsad, 2006. "Agent-based dynamics of social complexity: Modeling adaptive behavior and long-term change in Inner Asia." *Proceedings of the First World Congress on Social Simulation*. Kyoto, Japan.

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Scene of Altai Mountains with camels.