GANKORINIOTEK SINGOOR (CHITRAL) EXCAVATION 2021: A PRELIMINARY REPORT

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INTRODUCTION

Chitral was the largest district of Khyber Pakhtunkhwa Province of Pakistan before its bifurcation into upper and lower districts in 2018. This region, due to its isolated position, still preserves many of the native cultures and traditions. The Kalasha Tribe living in the Rambor, Birir and Bamborat valleys, having preserved their unique cultural heritage, are well-known to the world as well as being included in many anthropological and genetic studies to better understand their cultural and biological origins. Similarly, the free-style polo festival played in Chitral and Gilgit Baltistan is yet another example of the unique tradition still preserved in the region. Many of these living traditions are deeply rooted. For instance, the burial practices of the Kalasha tribe have close similarities with those of the Iron Age culture that existed in the region as early as 1000 BCE. This culture is also known as 'Gandhara Grave culture' due to the extensive number of the cemeteries initially reported from Gandhara region. The term 'Protohistoric Graves' is also used for the same cemeteries. More than 30 Iron Age Cemeteries have been reported from Chitral region. Some of these, including *Parwak Lasht* and *Shapiro Noghur* (Parwak, Upper Chitral), Chakast, Shahmirandeh and Gankoriniotek (Singoor, Lower Chitral), had already been excavated by different individuals and institutions (Ali et al, 2005; 2010; Samad et al, 2012; Zahir, 2019). Detailed of the ancient remains from these cemetery sites will help to understand their connection to present-day population and their cultures. Scientific analyses of the past human skeletal remains, especially ancient DNA (aDNA) analysis and radiocarbon dating, are key to establishing the ancestral contributions to present-day populations. However, previously excavated bones were not carefully collected for aDNA purposes, and thus the skeletal remains available from different cemetery sites are likely to be contaminated with modern DNA sources and are not ideal for aDNA studies. The present research titled "Excavation at the Iron Age Cemeteries in District Chitral" was thus designed to excavate the cemetery sites in Chitral more carefully and collect samples for aDNA analysis

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that minimize contamination from external sources. It is a 3-year research project fully funded by the Higher Education Commission (HEC) Pakistan and is aimed to:

- Characterise Iron Age human genetic diversity and migrations into the Chitral region
- Assess the genetic contributions of these ancient people to the present-day populations of the study area
- Reconstruct the human demographic history and health trajectory of this region through molecular analysis
- Provide an opportunity to the local students/scholars to get practical exposure in the field of archaeology and ancient genomics
- Promote multidisciplinary research within Pakistani archaeology by integrating ancient genomics

With the generous funding of the HEC under the NRPU program, the first season of this excavation project was successfully carried out at Gankoriniotek, Singoor, Chitral from June-October 2021. Gankoriniotek is one of the Iron Age cemeteries located in the Singoor Village of District Chitral. The word Gankoriniotek is a local term meaning a mound where wind blows continuously. The entire area (Gankoriniotek) is named after a mound located between the Garam Chasma road and the Chitral River. The mound is presently covered by the newly constructed building of Bejan Hotel (the first 5-star hotel in Chitral). The site lies between 35° 54′ 06.7″ N latitude and 71° 48′ 22.6″ E longitude (Fig. 1) and is 1564 meters above sea level.

Gankoriniotek is the most extensively excavated site in the Chitral region. The site was for the first time reported by the Directorate of Archaeology and Museums, Government of NEWP (now Khyber Pakhtunkhwa) in 2005. In 2007, limited excavations were carried out at the site by a joint team of archaeologists from Hazara University Mansehra and the University of Leicester (UK). Excavations at Gankoriniotek was resumed in 2007 and 2008 by the Department of Archaeology, Hazara University Mansehra (Ali et al, 2010). All these excavation projects were sponsored by Hazara University Mansehra. The antiquities unearthed during the excavations are now displayed in Abbott Museum Abbottabad of Hazara University and Hazara Cultural Museum of Hazara University Mansehra. In 2016, limited excavation at the site was carried out by Muhammad Zahir (Zahir, 2019). The site is disappearing due to modern construction. It was noticed that after the first excavation in 2007, five new houses were constructed on the site. It was for this primary reason that this site was selected for excavation in the current project. This time the western part of the site located between the excavated area and the modern house of Mr. Sharifullah was selected for excavation. This area comprises four major terraces that are all used as agricultural land. The selected area was properly mapped along with its surrounding features before starting proper excavation at the site.

GRIDDING AND PREPARATION OF MAPS

Before starting proper excavation, the site was divided into 380 trenches following the Wheeler excavation method. Each of these trenches measured 5x5 meter including the Baulks between them. A Specific number was allotted to every trench starting from the northwestern corner of the site with A/1 that ended with T/20 at the southeastern corner. The grid plan also covers five houses, the excavated area of 2007, 2008 and 2016, and the road leading to Shahmiran Deh (Fig. 2). Apart from the grid plan, contour map (Fig. 3) of the site was also prepared to document the surface features. Theodolite, Compass, GPS, staff rod and measuring tapes and rods were used for mapping and preparation of grid plan and contour map of the site.

EXCAVATION

After proper documentation and griding, six trenches were selected for excavation. These included D/12, D/13, E/12, E/13, F/12 and F/13 (Fig. 4). The datum point was fixed on a stone boulder near the southeastern corner of the third terrace. As the excavation was aimed to collect uncontaminated samples for DNA sequencing and molecular analysis, every measure was taken to minimize any sort of contamination. MPhil and PhD Scholars and other archaeologist who were engaged in the excavation were assigned specific trenches for supervision. These professionals were assisted by labourers to carry out heavy tasks such as removal of soil and stones, etc. After revealing the graves, each of the graves was assigned to an individual archaeologist assisted by two labourers who strictly followed protocols by wearing masks and gloves and covering their heads with hats or caps, etc. The excavation tools were also used separately according to the graves to avoid cross-contamination between graves. The tools were cleaned on regular basis with bleach and ethanol. The skeletal remains and other bones were carefully removed, packed, and labelled following the same protocols to avoid any contamination.

MAJOR ARCHAEOLOGICAL DISCOVERIES

The current excavation at the site revealed a total of 18 graves from four different levels. Of these, Grave no. 4, 11, 15, 16 and 17 were found empty; while the remaining 13 graves revealed burial remains of various types including inhumation, cremation and fractional. A detailed description of the graves is given below.

GRAVE 1

Grave 1 was the first grave revealed in trench no E/12 (Fig. 5). It was exposed at a depth of 0.57 m below the present surface. Being close to the surface, most of the grave structure was lost due to agricultural activities. The covering stones along with the southern, southeastern, and western walls of the grave were missing. The grave measured 1.60 meters in length, 0.85 meters in width and had a maximum depth of 0.43 meters. It was constructed of rough stones (schist and sand stones) of various size and shapes. Grave 1 most probably contained inhumation but due to its disturbed condition only few fragments of bones survived along with terracotta potsherds, a copper earring, and a stone barrel shape bead.

GRAVE 2

Grave 2 was reported at the eastern side of the earlier grave in the same trench. It was exposed 0.53 meter below the surface level. It measured 1.01 x 0.60 meters and was 0.22-meter-deep (Fig. 6). Evidence of cremation was reported from this grave in the form of burnt bones, ashes and charcoals. No artefacts were found in this grave. Most of the grave structure including covering slabs, southern, eastern, and southwestern walls were missing due to agricultural activities.

GRAVE 3

Grave 3 was exposed at the northwestern corner of trench E/13 at a depth of 1.40 meter below the present surface. It was disturbed probably during the digging to set a water pipeline in 1990s. This grave measured 1 x 0.53 meters and was 0.32-meter-deep (Fig. 7). Terracotta potsherds and bone fragments were unearthed during the excavation. The covering slabs of the graves were also missing.

GRAVE 4

Grave 4 (Fig. 8) was roughly circular in shape and constructed of sand stones of various size and shapes. It was exposed in E/13 at a depth of 1.60 meter below the present surface. The Grave itself measured 1.67x1.23 meters. It forms the second, upper Chamber of Grave 5 and, therefore, must have been constructed later than Grave 5. Bone fragments and potsherds were unearthed from Grave 4 during the process of excavation.

GRAVE 5

The largest and richest grave in terms of skeletal remains and grave goods, exposed during the current excavation. This grave was revealed in E/13. It was one of the few graves that was sealed initially by placing schist slabs. But covering slabs had later fallen into the grave chamber smashing the skulls and other bones. This grave was reported right beneath grave 4 at a depth of 1.95 meters below the present surface. It was roughly oval in shape (Fig. 9) and measured 1.97 x 1.22 meters. The grave was oriented east west and was constructed of larger schist slabs vertically or horizontally placed within the ground. The interspaces were then filled with smaller pieces of the same stone as well as pebble stones. This grave revealed multiple burials of five individuals buried along with grave goods including copper mirrors, rings, blade and terracotta glass and a broken jar. Remains of animal teeth were also reported from this grave.

GRAVE 6

Grave 6 was revealed in the Baulk between E/12 and 13 at a depth of 1.32 meters below the present surface. The grave measures 1.02 x 0.75 meters and was 33 meters deep. It contained a single crouched burial placed in north-south orientation with head to the north and face oriented towards east. The grave was constructed of pebbles, while mud was used for binding purpose (Fig. 10). The skeleton was found in a very fragile condition due to the absence of the capstone/s. Grave 6 was also rich in terms of grave goods. Terracotta female figurine was found lying on the eastern side of the body. While a stone bead, terracotta bowl, bottle, a tiny pot and iron knife blade and nail were found near limb.

GRAVE 7

Grave 7 was exposed in the Baulk between D/12 and E/12 at a depth of 0.48 meters below the existing surface. It measured 1.55 x 0.66 x 0.18 meters. Like grave 6, it was also constructed of sand stones, and mud was used for binding purpose (Fig. 11). The skeleton itself measured 1.36 x 0.40 meters. The grave contained a single individual in flexed position. The body was placed in east-west direction with head to the west and face oriented towards south. Important findings from this grave include Iron arrowheads and copper lockets. The skeleton unearthed was very fragile due to the absence of the capstone/s.

GRAVE 8

Grave 8 (Fig. 12) was exposed in the western corner of the Baulk between D/12 and E/12 at the depth of 0.57 meters below the existing surface. It measured 1.70 x 0.62 x 0.18 meters. This grave also contained a single extended burial. The formation of the grave as well as the orientation of the body and face of the skeleton were similar to grave 7. The only difference observed was that the skeleton was placed with crossed legs. Among the findings, glass beads, Iron Age, Copper Tamghas/necklaces and a copper earing are worthy to mention.

GRAVE 9

Grave 9 was exposed in E/12 at a depth of 1.30 meter below the existing surface (Fig.13). This grave was rectangular in shape and measured 0.90 x 0.49 meters and was 0.26 meters deep. The grave is oriented in north south direction. Schist stone slabs were placed horizontally against the walls of the grave. The capstones of the graves were found missing. Skull of an individual was reported lying on the northeastern corner of the grave buried with two terracotta bowls.

GRAVE 10

Grave 10 was exposed to the west of grave 9 from the same trench and 1.23 meters below the present surface. The formation and orientation of the grave was very similar to the previous one. The grave (Fig. 14) itself measured 1.16 x 0.65 x 0.30 meters, while the fragmentary remains of the single crouched burial measured 0.42 x 0.32 meters. The skeleton was placed in north south orientation with head on the southern side facing east. The grave goods found in this grave included two terracotta bowls placed with the individual, one (complete) in front of the face along with a stone bead and the other on its back placed along with an iron arrowhead.

GRAVE 11

An empty grave (Fig. 15) exposed in E/12 at a depth of 1.12 meters below the existing surface. This was one of the five empty graves and located to the west of grave 10. No archaeological and biological remains were found in this grave. The orientation and formation of the grave was similar to Grave 10. The southern part of the grave was also missing, most probably disturbed by the peasant.

GRAVE 12

Grave 12 (Fig. 16) was exposed in E/13 at a depth of 2.30 meters below the existing surface. Cremation was noticed in this grave in the form of burnt bones, ashes, and charcoals. The grave was constructed of sand stones and the capstones of the grave were missing. This area measured 1.56 x 1.10 x 0.12 meters.

GRAVE 13

An empty narrow grave (Fig. 17) found to the north of grave 9 and 10. The formation of the grave is similar to graves 9 and 10 but its orientation is slightly different. This grave is oriented towards the northwest and southeast. This grave measured 1.30 x 0.60 meters and was 0.45 meters deep. No biological and archaeological remains were unearthed from this grave.

GRAVE 14

One of the smallest graves (Fig. 18) exposed from E/12 at a depth of 160 cm. It measured 33x30x18 cm. The grave was further divided into two by placing a stone slab in east west direction. Only fragile fragments of bones were unearthed from this grave during the current excavation.

GRAVE 15

An empty grave (Fig. 19) reported from E/12 at a depth of 1.70 meters below the existing surface. This grave was roughly square in shape and measured 0.28 x 0.24 x 18 meters. No skeletal remains and artefacts were unearthed from this grave.

GRAVE 16

Another small empty grave reported between graves 14 and 15 at a depth of 1.70 meters below the present surface. It measured 0.40 x 0.28 x 0.19 meters (Fig. 20). It was roughly square in shape and was found covered/sealed by placing a capstone.

GRAVE 17

A small empty grave (Fig. 21) exposed in E/13 at a depth of 1.44 meters below the existing surface level. It was roughly square in shape and measured 0.24 x 0.22 x 17 meters. The formation of this grave was also very similar to other small graves.

GRAVE 18

The last grave (Fig. 22). excavated at the site during the current season work. It was exposed at a depth of 189 cm below the surface level and was rectangular on shape measuring 125x85x45 cm. Fragmentary remains of two fractional burials were reported from this grave. This was the only large grave which was found sealed with the capstones.

Catalogue of the Antiquities Reported from Gankoriniotek

S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
1	GTSC-001	Baulk Between E/12 &E/13		06	Figurine	Terracotta	S: 160 E: 30 Dep: 135	10x5.5 x0.6	Terracotta Female Figurine with small, pointed breasts. Legs are broken and rejoined	Good	10.9. 2021	
2	GTSC-002	Baulk Between E/12 &E/13		06	Bead	Stone (Chlorite)	S: 160 E: 40 Dep: 135	1.3 x 2.4 (Dia)	Stone round bead; black in colour. The outer surface is decorated with four incised circles and dots.	Good	16.9. 2021	
3	GTSC-003	Baulk Between E/12 &E/13		06	Pot	Terracotta	S: 166 E: 40 Dep: 135	6.7 x 6.3	Terracotta tiny pot with everted rim. Rim is slightly broken and missing	Good	16.9. 2021	
4	GTSC-004	Baulk Between		06	Knife Blade	Iron	S: 168 E: 48	20.7 x 1.8 x 0.7	Iron Knife Blade	Corroded	16.9. 2021	

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S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
		E/12 &E/13					Dep: 135					
5	GTSC-005	Baulk Between E/12 &E/13		06	Rod	Iron	S: 172 E: 52 Dep: 135	9.1 x 0.4	Iron Rod with pointed end	Corroded	16.9. 2021	
6	GTSC-006	Baulk Between E/12 &E/13		06	Bowl	Terracotta	S: 169 E: 52 Dep: 160	6.6 x 12.4 (Dia)	Terracotta Bowl with wide moth and simple rim.	Good	16.9. 2021	
7	GTSC-007	Baulk Between E/12 &E/13		06	Bottle	Terracotta	S: 170 E: 48 Dep: 160	15.3	Terracotta bottle with high funnel-neck bottle and round base. Part of the neck is missing	Broken	16.9. 2021	
8	GTSC-008	E/12		01	Bead	Stone	Grave no. 1	2.5x1.0 2 x 0.05 (Dia)	Stone Barrel Shape bead	Good	23.9. 2021	

S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
9	GTSC-009	E/12		01	Ear Ring	Iron	Grave no. 1	3.04 (Dia)	Iron Earring with a protruded shank.	Corroded	27.9. 2021	
10	GTSC-010	E/12		08	Locket	Copper	Grave no. 8	2.2 x 2	Copper object; probably used as locket?	Corroded	27.9. 2021	
11	GTSC-011	E/12		08	Arrow head	Iron	Grave no. 8	8 x1.5	Iron Arrowhead	Corroded	28.9. 2021	
12	GTSC-012	E/12		08	Fitting Object	Iron	Grave no. 8	3.2 x 2.06	Iron Fitting Object with nail on one side	Corroded	28.9. 2021	

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S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
13	GTSC-013	E/12		08	Locket	Copper	Grave no. 8	2.9 x 2.6	Copper heart shape objects probably lockets, four in numbers.	Corroded	28.9. 2021	
14	GTSC-014	E/12		08	Arrowhe ad	Iron	Grave no. 8	6.7 x 1.7	Iron Arrowhead with four-barbed flat blades	Corroded	29.9. 2021	
15	GTSC-015	E/12		08	Locket	Copper	Grave no. 8	2.7 x 2.2	Copper Object Probably used as a Locket?	Corroded	29.9. 2021	
16	GTSC-016	E/12		08	Axe	Iron	Grave no. 8	10 x 3.4	Iron Axe found in grave no 8 placed on the south side of the skeleton	Corroded	29.9. 2021	
17	GTSC-017	Baulk Between D/13 and E/13	03		Spindle Whorl	Terracotta		2.2 (Dia)	Terracotta Round Object with a hole in the center probably used as a spindle whorl	Good	23.9. 2021	

S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
18	GTSC-018	E/12	05		Ear Ring	Copper	N: 40 E: 65: Dept: 140	2.2 (Dia)	Copper Ear Ring	Corroded	3.10. 2021	
19	GTSC-019	E/13		05	Nail	Copper	Grave no. 5	10.7 x 1.3 (Dia)	Copper nail/pin with round umbrella cap	Corroded	2.10. 2021	
20	GTSC-020	E/12		10	Bead	Stone (Chlorite)	Grave no. 10	2.6 (Dia)	Stone Bead. The Outer surface is decorated with four incised circles and dot motifs	Good	4. 10 2021	
21	GTSC-021	E/12	05		Bead	Glass	Sievin g	0.3 (Dia)	Glass bead, light blue in colour (four in numbers)	Good	4.10 2021	
22	GTSC-022	E/12		10	Nail	Iron	Grave no. 10	7.9	Iron Nail, irregular in shape	Corroded	4.10. 2021	

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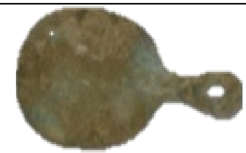
S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
23	GTSC-023	E/13		05	Button	Copper	Grave no. 5	i.2.7x1 ii. 1.9x1	Copper Buttons (two in numbers)	Corroded	5.10. 2021	
24	GTSC-024	E/12		08	Ear Ring	Copper	Grave no. 8	2.6 (Dia)	Cluster ear Rings	Corroded	6.10. 2021	
25	GTSC-025	E/12		08	Locket	Copper	Grave no. 8	2.6 x 2.4	Copper objects most probably used as a locket.	Corroded	6.10. 2021	
26	GTSC-026	E/12	05		Arrowhe ad	Iron	S: 154 E: 150: Dep: 160	2.9 x 2.6	Iron Arrowhead	Corroded	6.10. 2021	
27	GTSC-027	E/12	05		Ewer	Terracotta	Grave no. 8	18 x 7.2 (Rim Dia)	Terracotta Ewer, spout cut off and missing	Broken	6.10. 2021	

S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
28	GTSC-028	E/12		10	Bowl	Terracotta	Grave no. 10	5.5 x 11 (Rim Dia)	Terracotta Bowl; rim partially broken	Broken	6.10. 2021	
29	GTSC-029	E/12		09	Bowl	Terracotta	Grave no. 09	5.5 x 11 (Rim Dia)	Terracotta Bowl; Rim slightly broken and missing	Broken	28.9. 2021	
30	GTSC-030	E/13		05	Mirror	Copper	Grave no. 5	6.5x 4	Copper Mirror (Oval Shape)	Corroded	12.10 .2021	
31	GTSC-031	E/13		05	Mirror	Copper	Grave no. 5	6.2x 3.5	Copper Mirror (Oval Shape)	Corroded	12.10 .2021	
32	GTSC-032	E/13		05	Mirror	Copper	Grave no. 5	5.5x 3.6	Copper Mirror (Oval Shape)	Corroded	12.10 .2021	

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S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
33	GTSC-033	E/13		05	Mirror	Copper	Grave no. 5	4.5x 2.5	Copper Mirror (Oval Shape)	Corroded	12.10 .2021	
34	GTSC-034	E/13		05	Bangle	Copper	Grave no. 5	Averag e Dia: 5.2	Copper Bangle	Corroded	12.10 .2021	
35	GTSC-035	E/13		05	Beads	Copper	Grave no. 5	Largest : 0.6 x 0.5 Smalle st: 0.3 x 0.3	Copper Beads of different shapes and sizes (12 in numbers).	Corroded	12.10 .2021	
36	GTSC-036	E/12	03		Arrowhe ad	Iron	Benea th Grave no. 8	6 x 1.5	Iron Arrowhead	Corroded	13.10 .2021	
37	GTSC-037	E/13		05	Blade	Copper	Grave no. 5	8.3 x 2	Copper Blade, probably used for shaving purpose	Broken and rejoined	13.10 .2021	

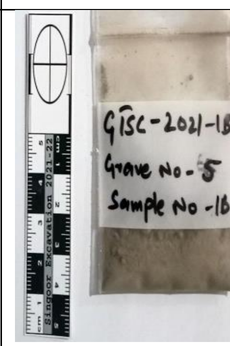
S. No	Reg. No.	Trench No.	Layer No	Grave No	Object	Material	3 DM	Size in cm	Description	Condition	Date	Photograph
38	GTSC-038	E/15		05	Sharpener	Stone	Grave no. 5	12.5 x 2.2 x 1	Stone sharpener with a hole on one side.	Good	13.10 .2021	
39	GTSC-039	E/12		05	Bead	Copper	Grave no. 5	1 x 0.3	Bead either copper based and golden colored or bronze as bronze looks gold when polished	Corroded	13.10 .2021	
40	GTSC-040	E/12		05	Mirror	Copper	Grave no. 5	5.5	Copper Mirror (partially broken and missing)	Corroded	13.10 .2021	
41	GTSC-041	E/12		05	Pin/Nail	Copper	Grave no. 5	23 x 2.7 (Dia)	Large Pin Nail round in section, globule surmounted by a disk-head	Good	12.10 .2021	
42	GTSC-042	E/12		05	Glass	Terracotta	Grave no. 5		Terracotta glass decorated with zigzag lines	Good	12.10 .2021	

SAMPLE SELECTION FOR FURTHER ARCHAEO-SCIENTIFIC ANALYSES

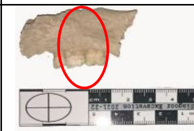
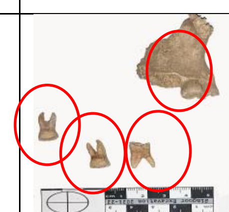
Having completed the excavation and documentation work, the registered antiquities were handed over to Incharge, Chitral Museum Chitral for the purpose of display. The skeletal remains and potsherds were taken to the Department of Archaeology, Hazara University Mansehra for further analysis and research.

The skeletal remains that were sealed after excavation were opened for taking samples for ancient DNA sequencing and radiocarbon dating. During this process, the same sterile sampling protocols as before were followed to minimize both contamination and physical damage to the bones. Details of the samples are given as follows:

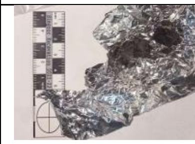
List Sample Selected for Archaeo-Scientific Analyses

S. No.	Sample Code	Trench/ Grave No	Type of Sample	Weight (in Gram)	Photograph
01	GTSC-2021-1A	T: E/13 G: 5	Bone Fragments probably of an animal collected from (inside terracotta Glass) reported between skull 1 and 2	1.00	
02	GTSC-2021-1B	T: E/13 G: 5	Soil sample taken from (inside terracotta Glass) reported between skull 1 and 2	11.00	
03	GTSC-2021-2A	T: Baulk (D/12 & E/12) G: 8	Petrous bone of the individual skeleton from Grave 8	21.00	

S. No.	Sample Code	Trench/ Grave No	Type of Sample	Weight (in Gram)	Photograph
04	GTSC-2021-2B	T: Baulk (D/12 & E/12) G: 8	Tooth Samples from Grave 8	3.00	
05	GTSC-2021-3	T: Baulk (E/12 & E/13) G: 6	Petrous bone (01) of the skeleton recovered from Grave 6	2.00	
06	GTSC-2021-4	T: Baulk (D/12 & E/12) G: 7	Petrous bone sample taken from the single burial reported from Grave 7	12.00	
07	GTSC-2021-5	T: E/12 G: 10	Petrous bone of the skull 1 recovered from Grave 10	32.00	
08	GTSC-2021-6	T: F/12 G: Jar Burial	Petrous bone recovered from the large size Jar reported from Trench no F/12	9 .00	
09	GTSC-2021-7A&B	T: E/13 G: 9	Petrous and teeth of the skeleton recovered from Grave 9	48.00	
10	GTSC-2021-8	T: Baulk (E/12 & E/13) G: 6	Second Petrous of the same skeleton reported from Grave no. 6 (i.e.GTSC-2021-003)	12.00	

S. No.	Sample Code	Trench/ Grave No	Type of Sample	Weight (in Gram)	Photograph
11	GTSC-2021-9	T: E/13 G: 5	Bone Fragments including teeth (most probably of Animals) recovered near skull no. 2 from Grave 5.	18.00	
12	GTSC-2021-10	T: E/13 G: 5	Bone Fragments from (inside terracotta Jar) recovered near skull no 1 and 2 from Grave 5	17.00	
13	GTSC-2021-11	T: E/12 G: 18	Lower Jaw fragment with teeth taken from skull no. 1, Grave 18	13.00	
14	GTSC-2021-12	T: E/13 G: 5	Teeth Samples taken from Skull no.2, Grave 5.	12.00	
15	GTSC-2021-13	T: E/13 G: 5	Teeth Samples taken from Skull no.1, Grave 5.	15.00	
16	GTSC-2021-14	T: E/13 G: 5	Bone fragments probably of animals recovered near skull no. 1 from Grave 5	62.00	
17	GTSC-2021-15	T: E/12 G: 18	Tooth Sample of Skull no. 1 collected from grave 18	1.00	
18	GTSC-2021-16	T: E/12 G:18	Skull and Tooth Samples of Skull 2 collected from Grave 18	23.00	

Petrous?

S. No.	Sample Code	Trench/ Grave No	Type of Sample	Weight (in Gram)	Photograph
19	GTSC-2021-17	T: Baulk (D/12 & E/12) G: 7	Tooth Sample collected from Grave 7	1.00	
20	GTSC-2021-18	T: E/12 G: 02	Charcoals sample collected from the cremation area in Grave 2	1.00	

DNA SEQUENCING AND MOLECULAR ANALYSIS

The samples listed above were sent to the University of Chicago (i.e. the collaborator Institute) for scientific analysis. Selected samples will be subject to DNA sequencing, molecular analysis, and radiocarbon dating, upon meeting requisite morphological preservation criterion of not being broken or worn out. Results of these analyses will help to address the questions of the current research. Briefly, the samples will be subjected to a screening procedure where, after cleaning and extracting DNA, the DNA will be sequenced to a limited extent. This data will then be analysed to characterise the amount of human DNA as well as to assess whether this is authentically ancient by looking for characteristic ancient DNA damage patterns. Those samples with reasonable human DNA percentage that also pass the authentication criteria will be processed for more DNA and sent for sequencing to generate more data. The data will then be analysed using population genetics tools to better understand their genetic affinities to one another and to other ancient and present-day populations from the region as well as for other biological characteristics such as kinship and molecular sex. Meanwhile, saliva samples will also be collected from 5 different present-day ethnic group for Chitral for comparison, which will help to establish their possible links with the ancient Iron Age population.

DISSEMINATION OF THE FINDINGS

After successful completion of the 1st season field investigation, A Two-Day International Workshop titled **"Iron Age Burials and Ancient DNA"** (Fig. 23) was organized on 24th -25th March, 2022 with the purpose to disseminate and share the findings of the project with the scholars and to train the students in multidisciplinary research. Apart from the Principal Investigator and research collaborators (Dr. Abdul Hameed, Dr. Maanasa Raghavan and Dr. Inamullah), scholars from other institutions were also invited as resources persons. The workshop was very successful, and more than 100 students and faculty members of Hazara University participated the workshop

CONCLUSION

The current archaeological excavation carried out at Gankoriniotek, Singoor Chitral has been very successful. The excavation revealed 18 graves associated with the Iron Age. Of these, 13 graves revealed biological and archaeological remains while the remaining five were found empty. Most of the graves revealed single inhumations in extended and in flexed position; some contained double and multiple burials with grave goods including jewelry, weapons, ceremonial terracotta pots, female figurine, and fragments of terracotta cakes. Some of the graves were found devoid of any biological and archaeological remains. Except graves 11 and 13, all of the empty graves were smaller in size measuring up to 28 x 24 cm. These empty graves might have contained infant burials or perishable offering materials such as clothes, food, etc. One of the smaller graves i.e. Grave 14 contained very few fragile bone fragments. Further analysis of these fragments may help to understand the purpose of these empty graves.

The graves were very carefully excavated to minimize any contamination and the skeletal remains were properly documented, packed, and labelled for transportation to Hazara University Mansehra, where samples were taken and sent to the University of Chicago for DNA sequencing and radiocarbon dating.

Results of the archaeo-scientific analyses will help us understand the genetic diversity and migration patterns of the Iron Age people in Chitral and their possible links with other ancient neighbouring populations as well as present-day population in Chitral. These investigations will also help us understand the ancient health trajectory of the region by mining the genetic data for the presence of ancient pathogens such as various bacteria and viruses that may have caused infectious diseases in these ancient humans.

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FIGURES

Figure 1. Google Map Showing Gankoriniotek Site in Singoor (Chitral)

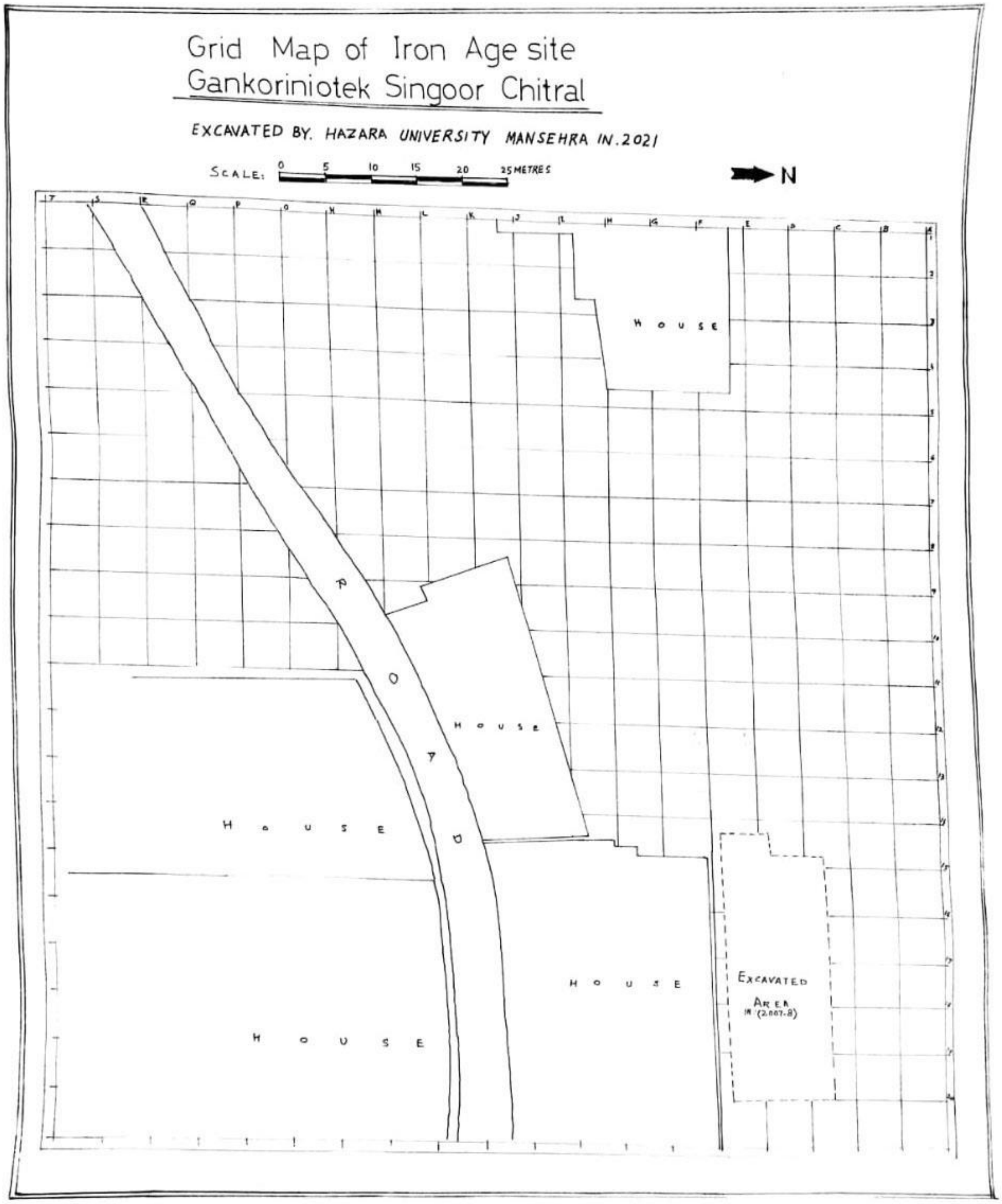

Figure 2. Grid Plan Showing the layout of Trenches and other associate Features

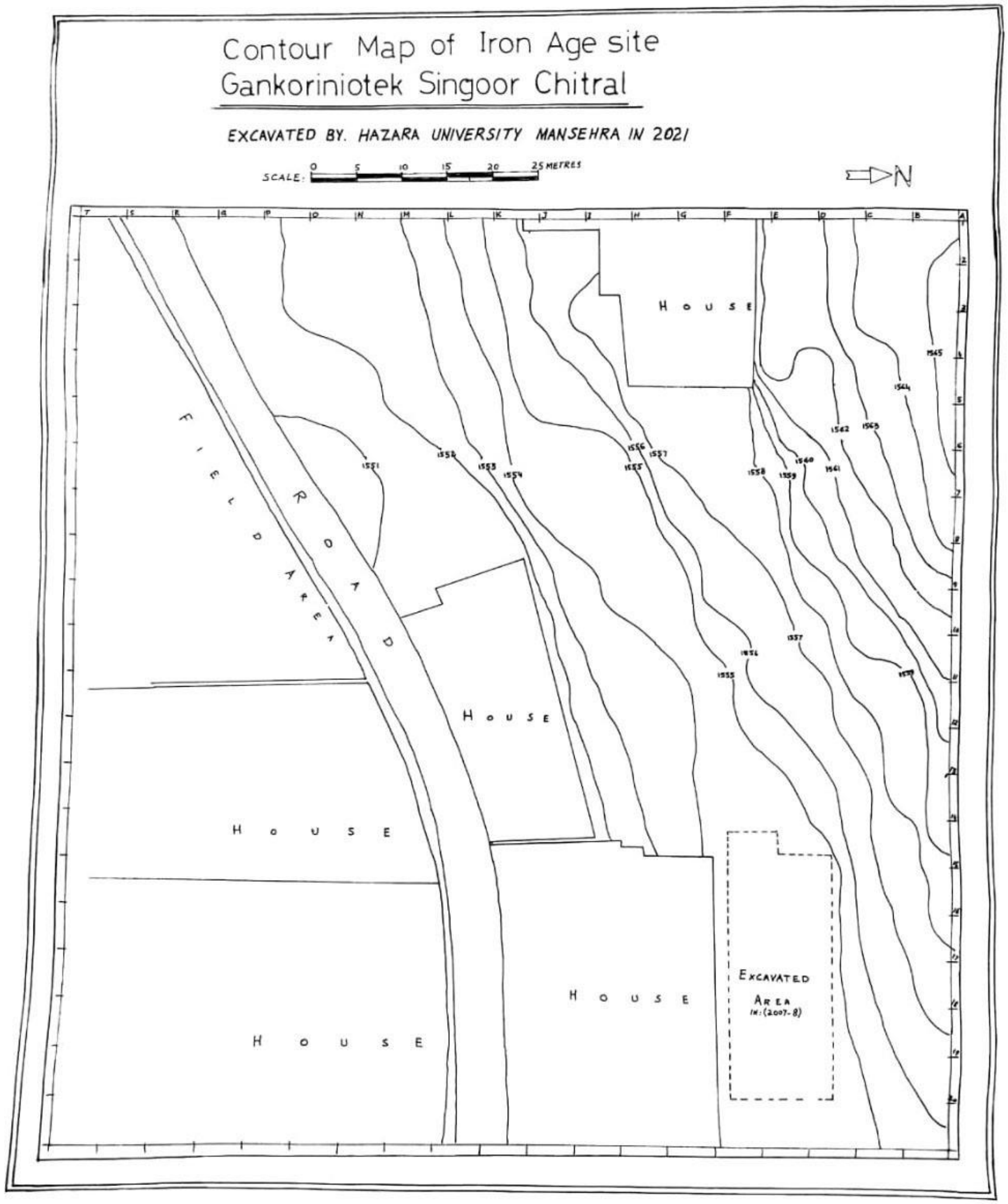

Figure 3. Contour Map of Gankoriniotek, Singoor (Chitral)

Figure 4. General View of the Trenches at Gankoriniotek site excavated in 2021

Figure 5. General View of Grave 1 at Gankoriniotek

Singoor, Chitral overlooking North

Figure 6. General View of Grave 1at Gankoriniotek

Singoor, Chitral overlooking North

Figure 7. Grave 3 Reported from Gankoriniotek Singoor, Chitral

Figure 8. Grave 4 at Gankoriniotek, Singoor Chitral reveals bone fragments and potsherds

Figure 9. Multiple Burials from Grave 5 at Gankoriniotek Singoor, Chitral

Figure 10. Crouched burial from Grave 6 at Gankoriniotek Singoor (Chitral)

Figure 11. Flexed burial from Grave 7 at Gankoriniotek Singoor (Chitral)

Figure 12. Extended Burial (with crossed legs) reported from Grave 8 at Gankoriniotek Singoor (Chitral)

Figure 13. Skull and Terracotta Bowls reported from Grave 9

Figure 14. Grave 11 at Gankoriniotek, Singoor, Chitral revealed crouched burial with terracotta bowls

Figure 15. Gankoriniotek revealed no archaeological and biological remains

Figure 16. Evidence of Cremation from Grave 12 at Gankoriniotek Singoor (Chitral)

Figure 17. Grave 13 at Gankoriniotek Singoor found empty

Figure 18. Grave 14 revealed fragile bone fragment

Figure 19. Grave 15 at Gankoriniotek revealed no archaeological and biological remains

Figure 20. Grave 16 at Gankoriniotek Found Empty

Figure 21. Grave 17; one of the smaller empty graves

Figure 22. Grave 18 Revealed Double Burials

A Two-Day International Workshop Organized
at Hazara University Mansehra on March 24-25, 2022