Preliminary Report of the 2024 Excavation in front of Caves 35-41 in Kizil (Xinjiang, China)^{1*}

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Abstract

The 2024 excavation by the Kizil Grottoes Research Institute and the School of Archaeology and Museology, Peking University, in front of Caves 35-41 at the Kizil Thousand Buddha Caves (Xinjiang, China) uncovered 19 features—including two rock-cut stairways, three small caves, one man-made stone structure—and recovered 394 artifacts such as ceramics, gypsum, copper coins, and glass beads. Stratigraphic analysis, combined with architectural study and radiocarbon dating, defined four main phases from the 3rd to the 8th centuries CE, followed by abandonment during the medieval period. The results clarify how the cliff face was cut, modified, and ultimately abandoned, refining the chronology and spatial organization of this sector. This work provides a key reference for Kizil's development and underscores the potential for further excavation of other cave areas and associated ground-level monastic structures.

Keywords: Rock-cut Buddhist monasteries, Xinjiang, archaeological report.

1. Introduction

The Kizil Thousand Buddha Caves are located southeast of Kizil Town, Baicheng County, Aksu Prefecture, Xinjiang Uyghur Autonomous Region, China (Fig. 1). Kizil is the largest among all known rock-cut monasteries in the ancient kingdom of Kucha. Most of these sites are situated along both sides of the Qoltag Mountains, which run east-west

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between the Tian Shan Mountain range and the Taklamakan desert. Buddhism flourished in Kucha from the 2nd century CE until the arrival of Islam in Xinjiang around the 11th century. Rock-cut monasteries are the primary surviving evidence of Buddhist material culture in the region. Besides, many other monastic complexes, constructed with rammed earth and mudbricks, are attested in literary sources, and some of them are currently undergoing archaeological excavation (Xinjiang Institute of Cultural Relics and Lanzhou University 2025).

The Kizil site occupies an alluvial fan-shaped terrain between the Muzart River (Weigan River) and Mingwutage Mountain, sloping gently from north to south, covering approximately 2.5 square kilometers. At present, no fewer than 349 caves survive, divided naturally into four areas: Guxi District (West of the Valley), Gunei District (Inner Valley), Gudong District (East of the Valley), and Houshan District (Rear Mountain).

At the beginning of the 20th century, the sites of the ancient kingdom of Kucha were visited by several scholar-explorers from Japan, Russia, France and Germany. The most relevant documentation was produced by the German expedition (Grünwedel 1912; von Le Coq 1926).

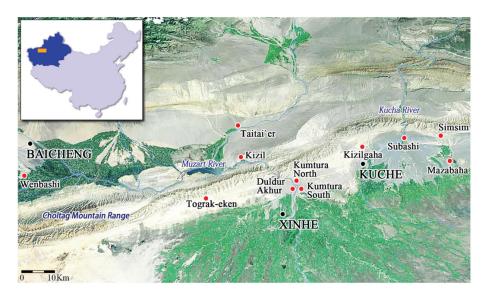


Fig. 1 - Location and surrounding of Kizil, Map adapted from Mapworld (www.tianditu.cn [23rd March 2013]). Present county towns are written in capital letters, ancient monasteries in small letters, mountains and rivers in *italics*.

The area in front of Caves 35-41, the object of the 2024 excavation, was visited by the German explorers in 1906 and 1913. They removed part of the debris and exposed the lower section of a stairway leading to Caves 36 and 37 and a small cave below it, as recorded in a drawing by Grünwedel (Fig. 2; Grünwedel 1912: fig. 121) and in several photographs now housed in the archives of Museum für Asiatische Kunst in Berlin (CrossAsia 2025). However, these remains have long since been buried. Vignato (2023: 903) was the first to note these features and suggested that the staircase's lower parts and other caves remained beneath the current surface, thus warranting excavation (Vignato 2023: 903). The clearing of the area in front of the caves in the westernmost area was carried out between 1979 and 1995. During this time, Peking University collaborated with the Kizil Thousand Buddha Cave Preservation Institute to produce an archaeological report volume of Caves 1 to 23A (Peking University and Kizil Grottoes Research Institute 1997). The report, published in 1997, was meant to be the first of a series covering the entire Kizil site, but the work was halted.

The 2024 excavation, whose preliminary results are presented in this article, was undertaken as a continuation of this effort, focusing on the area in front of Caves 35-41 (Figs. 3-4). The excavation was expected to clarify the different phases of construction, use, collapse, reuse, and abandonment of the caves above, and to uncover the nature of the connections among the caves. Caves 35-41 belong to different groups.² The main group consists of Caves 38-41, which are respectively a central pillar cave, an undecorated square cave, a monastic cell and a small deposit cave. These caves originally featured a shared rock-carved balcony. After its collapse, a cantilevered timber balcony was embedded into the cliff, where evident marks of it can still be seen. This group was presumed to have been accessed from the east; a hypothesis confirmed by the discovery of a stairway to the east of Cave 41. Another partially preserved stairway next to Cave 35 leads to monastic cell Cave 36 and Cave 37, a small deposit cave accessed from the landing of the stairway. Lastly, monastic

² A "group of caves" refers to a number of caves carved close to one another, often at the same level, usually connected by architectural elements and enclosed within well-defined boundaries. Groups are identified through in situ observation and study of maps, which disclose data such as rock quality, traces of remaining structures, structural superimposition, and the ways caves were accessed and linked (Howard and Vignato 2014: 26-39).

cell Cave 35, likely belonging to the group comprising Caves 33-35 to the west of the present excavated area, was included in the excavation because its proximity.

From May to October 2024, the Kizil Grottoes Research Institute and the School of Archaeology and Museology at Peking University carried out excavations in front of these caves. A fixed reference point for the excavation was established to the right of Cave 34A. Excavation squares were laid out in two tiers: four 10×10 m units (T0101–T0104) were positioned along the base of the cliff, followed by a 5×20 m trench (TG1) extending eastward to investigate a deeply eroded gully. Below the slope, an additional four 5×10 m units (T0401–T0404) were set on relatively flat ground near the stream. In total, the excavation covered approximately 700 square meters (Fig. 5). The project uncovered 19 archaeological features (Figs. 6-7) and yielded 394 artifacts.³

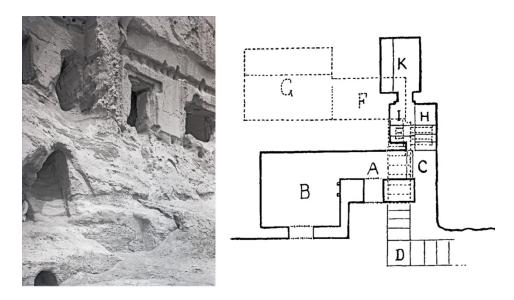


Fig. 2 - Left: Photograph by the German expedition showing some of the features emerged in 2024 excavation (Museum for Asian Art, Berlin, no. B1305); right: Drawing of Caves 36-37 (After Grünwedel 1912: fig. 121).

³ Surveying, drawing, and photography were carried out by the authors.



Fig. 3 - Satellite image of the Kizil Caves indicating excavation location.



Fig. 4 - The excavated area (yellow line) and the surrounding environment.

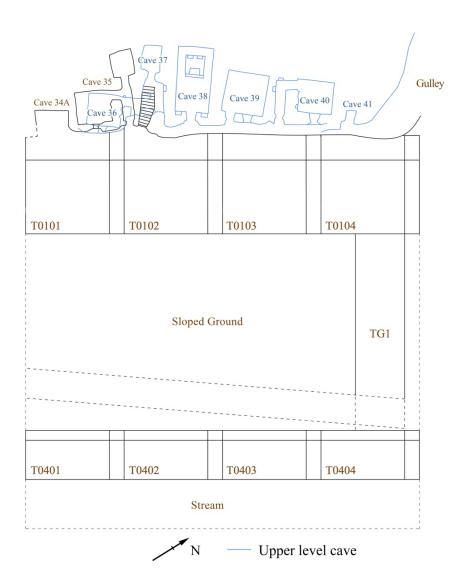


Fig. 5 - Excavation grid layout (2024) and relative position of caves above (Drawings by the authors).

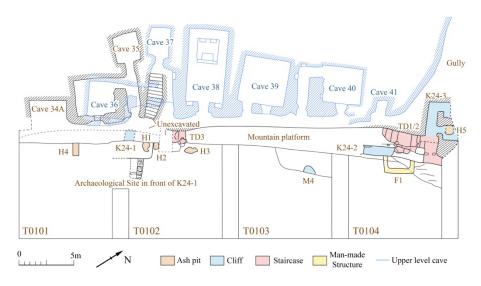


Fig. 6 - General plan of the 2024 Excavation (Drawings by the authors).

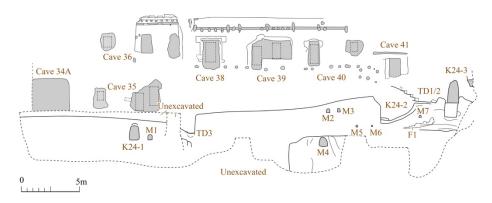


Fig. 7 - Elevation of the cliffside features in the 2024 excavation (Drawings by the authors).

2. Stratigraphic sequence

The sloped ground in front of the caves formed gradually through successive episodes of collapse and sediment accumulation, reaching a total thickness of approximately ten meters. Excavations confirmed that the cliff face in front of the caves is notably steep and, in some areas, nearly vertical. To analyze the stratigraphy, profiles were recorded from several key sections: the northern walls of squares T0101–T0104, the western wall

- of T0102, and the eastern walls of T0104 and trench TG1 (Fig. 8). The following stratigraphic layers were identified:
- **Layer 1**: Modern surface and fill layer, relatively sandy grey-brown soil, primarily containing modern artifacts.
- Layer 2: Collapse deposits, fine sandy grey soil, loose, mainly containing mudstone and sandstone rock fragments, related to the collapse of the cliff.
- Layer 3: Disturbed layer, mainly consisting of relatively dense reddishbrown clay with significant presence of charcoal. Other included materials are pottery sherds, bricks, gypsum flooring, copper coins, wood, and animal bones.
- **Layer 4**: Late cultural layer, relatively dense reddish-brown clay with a significant amount of charcoal inclusions. Other frequent finds include *Kaiyuan Tongbao* coins (Tang Dynasty coins in circulation from 7th century to 10th century), pottery sherds, glass, gypsum and other material.
- **Layer 5A**: Collapse deposits, light brown in color, composed of a mixture of relatively loose coarse sand and denser fine sand, containing a large quantity of stone chunks, as well as pottery sherds, fragmented terracotta figurines, bricks, animal bones, charcoal, and other materials.
- **Layer 5B**: Cultural layer with an extended period of deposition, dense purple-red clay with pottery sherds and charcoal.
- **Layer 6**: Sandy layer, loose yellow-grey and light grey silty sand, containing small mudstone chunks and a very small quantity of pottery sherds.
- **Layer 7**: Cultural layer, composed of a light yellow, relatively compact coarse sand and clay-bearing sand, containing a small quantity of mudstone fragments. Near the bottom, several hard and well-shaped angular stone chunks were found. The layer yielded a considerable amount of pottery sherds and animal bones, as well as stone tools, gypsum, charcoal, and copper coins.

Layer 8: Collapse deposits, composed of a light yellow, relatively compact coarse sand and clay-bearing sand, containing a large quantity of mudstone and sandstone fragments, along with a small quantity of pottery sherds.

Layer 9: Collapse deposits, composed of loose brown-grey coarse sand or light grey loose fine sand, containing a large quantity of mudstone and sandstone fragments, along with a small quantity of pottery sherds and charcoals.

Layer 10: Virgin soil, reached only in the eastern trench of T0104 and northern section of TG1, it consists of loose brown-grey and grey sandy soil with very few inclusions.

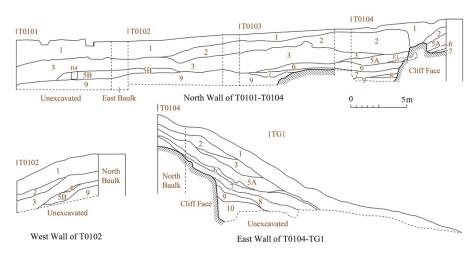


Fig. 8 - Sections showing the stratigraphic sequence observed in the 2024 excavation (Drawings by the authors).

3. Architectural Features

During the excavation partially preserved architectural features have been unearthed. They comprise two staircases (TD1/TD2 and TD3), three niches (K24-1, K24-2, K24-3) (Fig. 7), one stone-built structure (F1), and five ash pits (H).

The stairway leading to Caves 38-41 (TD1/TD2), is located at the eastern end of the excavation area (northeast of T0104) and represents two

successive phases (Fig. 9). The original rock-cut stairway (TD2) was carved into the cliff face. The first flight of stairs was cut perpendicular into the cliff to the lower landing, then the stairs turn at a right angle to form a second flight, parallel to the cliff façade, which connects to the balcony (Fig. 10). The preserved dimensions are approximately 265 cm in total rise, 516 cm in length, and 246 cm in width. A complete step measures approximately 106 cm in width with a tread of 40-50 cm and a rise of 25-30 cm.

We estimate that the original rock-cut stairway (TD2) had nine steps in total. It was not fully revealed during the excavation in order to preserve the later restored section (TD1). Restoration in antiquity was likely carried out after a partial collapse. TD1 survives only above the lower landing and measures approximately 516 cm in length, 186 cm in width, and 128 cm in total rise (Fig. 11). On the northeast side, a compact activity surface, roughly 10-13 cm thick, was laid atop the collapse deposits covering the remnants of the original stairway. Three steps are preserved on the southwest side, reinforced with soil and wooden slats at each tread-riser junction (Fig. 12).

Contemporaneous with the reconstructed stairway to the east (TD1) is a cave that consists of a tunnel-shaped corridor with two small chambers on its right side (K24-3, Fig. 13). The barrel-vaulted corridor measures approximately 65-95 cm in width and 183-195 cm in height, with a northwest to southeast orientation. Located in the northeast section of T0104, its floor is at the same level of the lower landing of stairway TD1, overlain by Layer 7.

The current cave entrance lies approximately 217 cm from the rear wall of the tunnel-shaped corridor; however, the original entrance may have been located farther in the front, the estimated original depth of about 311 cm. The two side chambers were accessed through doorways approximately 65-80 cm wide. They are square in plan, with sides of approximately 130-140 cm. The upper and left sides are partially preserved; due to security concerns, they remained largely unexcavated.

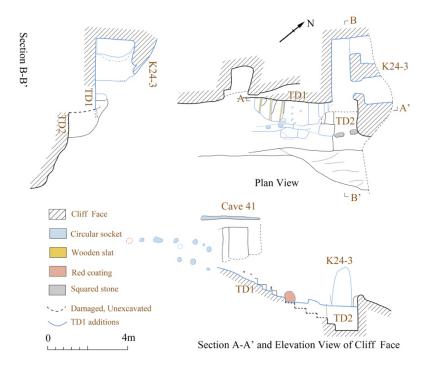


Fig. 9 - Composite view of TD1, TD2, and K24-3 (Drawings by the authors).

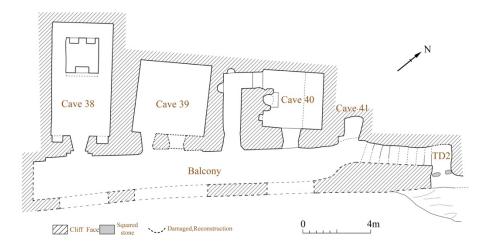


Fig. 10 - Reconstruction of TD2 in combination with the caves (Drawings by the authors).

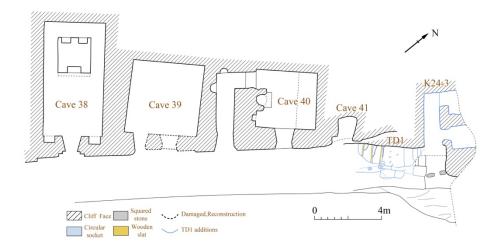


Fig. 11 - Plan view showing TD1 in relation to the caves as well as K24-3 (Drawings by the authors).



Fig. 12 - Steps of TD1 and the exposed upper steps of TD2 with the partially preserved wooden slats (viewed from northeast to southwest).

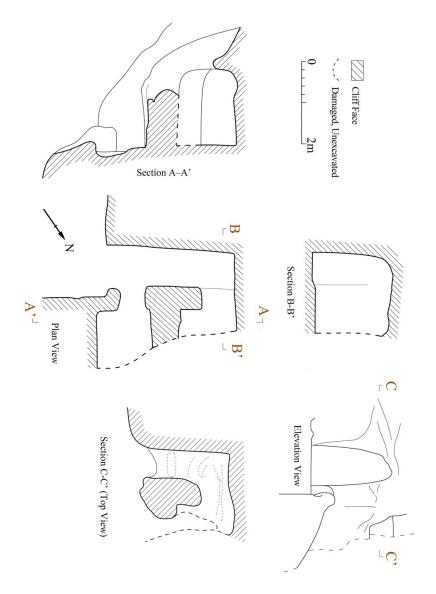


Fig. 13 - Plan, elevation, and section of K24-3 (Drawings by the authors).

Finally, laid against the northern cliff face of T0104, is a man-made structure (F1) composed of stone blocks (Fig. 14). The structure is rectangular in plan, measuring 263 cm in length, 157 cm in width, and 64.5 cm in depth, and was built on top of a purposely flattened surface of an

otherwise steep slope. The construction was set upon Layer 6, overlain by Layer 5A that contains a large quantity of collapsed rock fragments, which may be related to the collapse of F1. The right side is damaged, preserving only the lower portion of a relatively hard bedding layer; the long side running parallel to the cliff face shows stone chunks orderly stacked. The bedding layer is made of brown, relatively compact sandy clay.

A second stairway carved into the bedrock (TD3) was revealed during the excavation—it is partially visible in some photographs from the German Turfan expedition (Fig. 2). This feature is in fact the lower section of a more complex stairway leading toward Cave 36. Located to the north of T0102, only the lower portion of this stairway was exposed due to safety concerns (Fig. 15). The landing measures 67 cm in width and 73 cm in depth, and part of the east wall is preserved to a height of 110 cm. The lower section of the stairway, which originally cut perpendicularly into the cliff, is now lost. At the same elevation of the landing, a vertical stack of relatively regular stone blocks was found. It is believed they may have been used to stabilize the terrace and compensate for difference in elevation after the collapse of the front part of the cliff. Additional shaped stones scattered to the south may have belonged to the same structure. One step has been uncovered, measuring 108 cm in width, with a tread of 55 cm and a rise of 9 cm. The landing surface shows evidence of repair, with regular-shaped cobbles and high-quality stone slabs laid in place. The original landing itself is buried under silt deposits; approximately 23 cm above it, a compact white ash tread surface and a circular patch of grey ash soil have formed, likely a restoration.

A small rectangular cave (K24-1), located below Cave 35, is also partially visible in photographs from the German Turfan Expedition (Fig. 2). The cave features a rectangular floor plan and a barrel-vaulted ceiling, measuring approximately 95 cm in depth, 85 cm in width, and 126 cm in height (Fig. 16) In front of the entrance, at the same elevation as the cave floor, lies a rectangular, levelled earthen platform constructed from variegated earth, showing traces of burning that resulted in red-fired earth rich in charcoal and ash. Traces of purposely laid stone slabs, coated with yellow clay, are visible on the southern side of the platform.



Fig. 14 - F1 (viewed from southeast to northwest) viewed from above.



Fig. 15 - Location of TD3 revealed during the 2024 excavation (viewed from southeast to northwest). On the right is the landing, from which the stairway proceeded upwards up to Cave 36. On the left, the entrance of the small cave K24-1, still unexcavated.

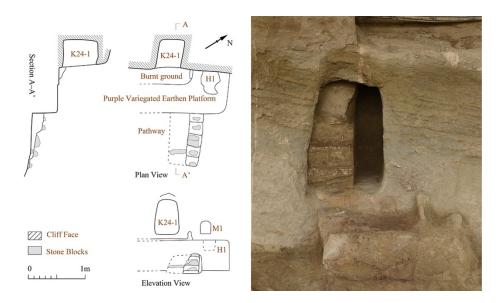


Fig. 16 - Plan, elevation, and section of K24-1(left) and exterior elevation of K24-1 (right) (viewed from southeast to northwest).

4. Excavated Artifacts

A total of 394 artifacts were recovered during the excavation. They primarily consist of ceramic objects, stone artifacts, gypsum, wooden objects, copper coins, and glass. In addition, a considerable quantity of charcoal, as well as several fruit pits, and bones of animals and plants were collected.

(1) Ceramics and Terracotta

A total of 259 items (or assemblages) were recovered. Most are red earthenware, and a small quantity is grey ware. The assemblage consists mainly of vessels and bricks, as well as ceramic molds and terracotta figurines.

Ceramic vessels include jars, pots, bowls, basins, urns, and lamps, primarily in fragmentary condition. A few examples are glazed in green, blackened from firing, or painted in red pigment (Figs. 17-18).

Jar T01047:1 — fragment of a red earthenware jar with handle. The vessel has a flared rim, rolled lip, double-thickened edge, and constricted neck. One handle is preserved. The surface is plain and burnished, coated in yellow slip. Rim diameter: 17.8 cm; neck inner diameter: 9.5 cm; preserved height: 10.5 cm; wall thickness: 0.9-1.1 cm (Fig. 17.1).

Bowl T0103(3):9 — red earthenware bowl with a contracted mouth and rounded lip with evidence of wheel throwing. The surface is plain and burnished, with a yellow slip applied. The outer surface bears three Brāhmī characters incised post-firing. Rim diameter: 17.2 cm; preserved width: 15.7 cm; preserved height: 8.5 cm; wall thickness: 1 cm (Fig. 17.2).

Glazed pottery sherds — most are made of red earthenware with green glaze applied on both interior and exterior surfaces. T0102(1):4 — flared rim fragment with slightly folded edge; preserved length: 5 cm; width: 3 cm; thickness: 0.8 cm (Fig. 17.3). T0102(3):7 — red ware with sand temper; exterior covered in yellowish-white glaze, decorated with two incised string patterns; preserved length: 3.4 cm; width: 2.8 cm; wall thickness: 1.1 cm.

Terracotta figurine T01045 A:1 — red earthenware; facial features partially preserved with clear rendering of eyes and nose; preserved width: 2.3 cm; height: 4.3 cm; thickness: 1.7 cm (Fig. 17.4)

Ceramic mold T0101③:11 — red earthenware, with relief decoration featuring wave and scroll patterns. The surface shows blackening from firing; preserved length: 12 cm; width: 11.5 cm; thickness: 2.3 cm (Fig. 17.5).

Bricks — mostly red-bodied clay with green glaze. T0101③:1 — rectangular in shape, with traces of green glaze on one side; preserved length: 18.3 cm; width: 10.5 cm; thickness: 3.7 cm (Fig. 17.6).

(2) Gypsum

A total of 41 items (or assemblages), all gypsum panels used as architectural components. Most exhibit nipple-like bosses, and some retain traces of pigment.

T01013:4 — gypsum panel with two nipple bosses on the reverse; preserved length: 19 cm; width: 8.8 cm; thickness: 2.3 cm (Fig. 18.1).

T0102(1):6 — fine-textured and smooth surface, red pigment applied on one side. Two fragments: one measures $4.5 \times 4.0 \times 0.65$ cm, the other $4.1 \times 2.4 \times 0.6$ cm (Fig. 18.2).



Fig. 17 - (1) Handled pottery jar, T0104(7):1; (2) Pottery bowl with Brāhmī inscription, T0103(3):9; (3) Green-glazed pottery sherd, T0102(1):4; (4) Pottery figurine, T0104(5)A:1; (5) Ceramic mold, T0101(3):11; (6) Glazed brick, T0101(3):1.



Fig. 18 - (1) Gypsum panel, T0101(3):4; (2) Red-painted Gypsum panel T0102(1):6.

(3) Stone Artifacts

A total of 26 items, including grinding stones, stone bars, stone tiles, and mica flakes. Materials include locally available sandstone and mudstone, as well as harder limestone not native to the site.

Grinding stone T0103(3):18 — quartzitic sandstone; one side preserves parallel grinding striations in two directions (spacing 0.7-1 cm), opposite side polished; preserved length: 32.5 cm; width: 16.5 cm; thickness: 3 cm; weight: 2.27 kg (Fig. 19.1).

Grinding stone T01047:4 — sandstone; grinding surface shows concentric circular patterns, reverse side rough; diameter: 49 cm; preserved length: 47 cm; width: 43 cm; thickness: 5.5 cm; central perforation diameter: 2.3 cm; weight: 11.95 kg

Stone bar T0104(7):9 — limestone; rectangular bar-shaped object, dark in color, hard texture, smooth surface with sharp edges; preserved length: 22.8 cm; width: 6.5 cm; thickness: 1.7-3 cm; weight: 748.5 g.

Stone tile T0104(5)A:4 — mudstone; rectangular block, regularly shaped, broken into three sections; preserved length: 56 cm; width: 19 cm; thickness: 12-14 cm; weight: 17.9 kg (Fig. 19.2).





Fig. 19 - (1) Grinding stone, T0103(3):18; (2) Stone tile T0104(5)A:4.

(4) Other Artefacts

Artefacts made from other materials include:

Copper coins (28 items/assemblages), including *Kaiyuan Tongbao* (Fig. 20.2), Kucha small coins (4th-7th centuries CE), and Kucha *Wuzhu* (5th-7th centuries CE) coins. Most are heavily corroded and illegible.

Glass artifacts (7 items), including fragments and beads, primarily green in colour.

Glass bead T0102CJ:1 — green, six-lobed sphere with central perforation; diameter approx. 0.9 cm (Fig. 20.1).

Wooden objects (11 items), mostly elongated wood fragments and wooden beads.



Fig. 20 - (1) Glass bead, T0102CJ:1; (2) Copper coins *Kaiyuan Tongbao* (in circulation during 7th-10th centuries).

5. Conclusions

This excavation revealed the original landscape in front of Caves 35-41 at Kizil. Each cave was carved into the cliff overlooking a steep drop and access was achieved via stairways cut into the cliff. Two such stairways were uncovered—one on the west and one on the east. The western stairway leads to Caves 36 and 37, while the eastern stairway provides access to Caves 38-41.

Based on stratigraphic relationships and radiocarbon dating, the formation process of the archaeological remains can be divided into four phases:

Phase I: Corresponding to Layer 9. This phase is associated with the construction of the caves and their early use. The eastern staircase was cut together with the front corridors of Caves 38-40. The lower steps still preserve chisel marks and are relatively well preserved, suggesting that collapse occurred shortly after construction. This collapse damaged the outer wall of the staircase and the cave balcony burying the lower portion of the inner stairway.

Phase II: Corresponding to Layers 7 and 8, as well as the rebuilt portions of the stairways. Radiocarbon dates cluster between the first half of the 5th century and the second half of the 6th century CE. This represents a phase of concentrated reconstruction and use. During this period, the stairway (TD1/TD2) was remodelled, and the tunnel-shaped corridor with two small chambers on its right side (K24-3) was added.

Phase III: Corresponding to Layers 4, 5, and 6. A phase of repair and continued use, that includes the repair of the eastern stairway using earth and wooden strips, and the construction of man-made structure (F1) atop the accumulated deposits of Layer 6. Radiocarbon dates from this phase range from the second half of the 6th century to the 8th century.

Phase IV: Corresponding to Layer 3 and above. Layer 3 entirely covers the underlying remains, indicating that the area had been abandoned by this time. Radiocarbon results for this layer vary considerably, from the 3rd century extending as late as the 13th to 14th centuries. Subsequent accumulation in the area was purely natural or modern.

In summary, this excavation clarified the processes by which the cliff face was modified to construct the caves, as well as the stratigraphy of the area in front of the caves. By integrating stratigraphic analysis with cave architecture, it traced the chronological development from the initial construction, through collapse and modification, to the final abandonment. This project represents the first systematic and scientific archaeological investigation of the area in front of the caves at Kizil. It provides an important reference point to study the chronology and spatial organization of the caves in Kizil. Future work should include excavation of other cave areas and further efforts to locate associated ground-level monastic structures.

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