

# Trial Excavation of a Cave System in Muktinath Valley

Preliminary studies in the settlement archaeology of the high mountain region of Mustang District (West Nepal)

-Angela Simons

In July 1990 the author was able to carry out three weeks of archaeological work in a cave system in Muktinath Valley.<sup>1</sup> In prehistoric times numerous such cave systems were dug into the faces of the rock massifs exposed to the sun situated alongside the riverbeds in the whole region between South Mustang (north of Jomsom) and the Tibetan border (Fig. 1).<sup>2</sup> The cave rooms are arranged in several levels; some of the cave systems contain more than seven floors.

The cave systems in the Mustang District were first mentioned by G. Tucci (1953, 55)<sup>3</sup> in his report on his journey to Mustang. In 1986 and the following years, the tibetologist D. Schuh and some colleagues managed to climb into and survey some of the cave systems in Muktinath Valley and thus collect the first samples for radio-carbon dating. The first data suggested that the

origins of the cave systems go back far into prehistoric times.

The aim of the 1990 research programme was mainly to gather sound data in order to plan the proposed archaeological work in the high mountain region of Nepal. Therefore, we wanted to collect well documented samples in a cave system and thus get an idea of the chronology and the former usage of these archaeological monuments.

## The "F-System"

In the upper Muktinath Valley a large rock massif is situated on the northern bank of the river Dzong opposite the village sites of Dzar (Jharkot) and Khyinga. At its easternmost corner lie the castle and the village of Dzong (Jhong). The

south and west facing parts of this rock massif contain several multi-storey cave systems, some of which had already been explored by the group of D. Schuh from 1986 to 1988.

The cave system, which is located at the western edge of the rock massif near the small tributary valley forming its border, has been called F-System (Fig. 2). The cave rooms were dug into the steep rock face directly above the river Dzong; the river terrace, which is preserved below the eastern cave systems (A to E), is missing at this site. The cave system is made up of two formerly connected parts which are now separated by a deep gully, the south-eastern F-System (Activity 90.2) and the north-western F-System (Activity 90.14). The remains of a gallery connecting both parts show that they belonged to each other during at least one phase of the occupation. The traces of the stone wall which was supported by wooden beams are recognizable.

The 1990 archaeological work concentrated mainly on the south-eastern part of the F-System. There the cave rooms are arranged in six floors but the caves of the four lower levels have been filled up with debris, leaving only small openings. The erosion of the soft conglomerate rock-material has also destroyed portions of the former cave rooms; the entrances of many caves are broken out irregularly and some cave rooms are preserved only as small niches in the rock face. The caves of the two upper floors were preserved best and thus investigated first. The entrances of the caves of the Lower Main Floor were located about 27 m above the river bed, those of the Upper Main Floor around 30 m. Therefore, prior to the archaeological work the spelaeologist D. Gebauer had to prepare access to the caves; he also connected the rooms of the two main floors by installing mountaineering

ropes.

In the north-western part of the cave system only one small cave room could be examined thoroughly. The access to it was rather difficult as its entrance height above the river was 52 m. H.D. Gebauer and D. Schuh also managed to climb into some other cave rooms, thus discovering a large cave more than 10 m long, the entrances of which were nearly totally buried under debris.

### Archaeological Features of the F-System

Cave rooms of the Upper Main Floor in the south-eastern part of the F-System (Activity 90.2) Fig.3 above

#### Locations 9-13

The entrance of the westernmost cave of the Upper Main Floor lies 29.90 m above the river Dzong. Remains of brickwork and plaster are preserved at the door opening to the south and at the small window above a big boulder facing south-west. The usable area of the interior is about 12 m<sup>2</sup>, the width measuring 2 m at the door and widening to about 4 m at the rear wall. The maximum height of the cave is 1.20 m.

Along the walls the former inhabitants had erected mudbrick structures, utilising the niches and boulders left after digging the cave room. These box-shaped structures, which take up nearly half of the usable area, were built of 5 to 7 layers of mudbricks, subsequently plastered carefully. Remains of cereal plants, stalks and ears, cover the floor of the cave. Because of the large amount of crop remains, mainly barley, it seems plausible that the mudbrick structures were used to store the crop; the recent storing boxes in

the region are of about the same form and dimension.

A trial trench in front of the structures against the west wall showed that only a thin layer of sediment some 20 cm thick had accumulated upon the rock floor. The whole sediment contained a great deal of cereal debris, stalks and ears, which suggests long use as a grain-store.

Three  $^{14}\text{C}$ -dates were obtained from this room. The plant temper of a mud-brick from the destroyed feature east of the entrance gave a calibrated date of A.D. 557  $\pm$  20 (KN-4358 = Nepal 1990/8),<sup>4</sup> whereas a smaller brick from the semi-circular feature in the north-west corner realised a calibrated date of A.D. 1297  $\pm$  87. Finally, the grain stalks from the floor-surface in front of the western structures produced a calibrated date of A.D. 1363  $\pm$  41 (KN-4354 = Nepal 1990/4). Thus, we already have useful dates for the chronology of the cave-system's utilisation: the construction of the mud-brick structures for grain-storage seems to fall at the beginning of its use, perhaps directly following the establishment of the rooms. The different sizes of bricks bear witness to the renewal and addition of features during the occupation. The room was finally in use during the Tibetan medieval period.

#### Locations 14 and 15

The cave-room attached to the east in the upper main floor of the F-System comprises a much smaller ground-surface of about 4.5m<sup>2</sup>. The conspicuous black layer of soot and tar firmly adhering to the cave's ceiling could only have developed over a long period by cooking over an open hearth. Against the south-eastern wall there survives a U-shaped hearth built of mud-bricks set upright, which on the inner surface have been burnt irregularly owing to the fire. Two thin slates set in a clay mixture served as a cooking surface.

Between the sides of the hearth's superstructure lies a slate with a depression for the fuel. According to the finds and specimens taken, wood, which was found with traces of cuts and burning, and dried cattle-dung acted as fuel. Plant remains (examined by Dr. K.-H. Knörzer) and the many animal bones, especially the fleshy bones of sheep/goat and yak (examined by Prof. Dr. A. van den Driesch) proffer evidence of the meals taken.

The  $^{14}\text{C}$ -analyses of the area around the hearth have produced widely varying dates. The much older date obtained from the temper of one mud-brick displays a large range of error, i.e.  $\pm$  300 years, owing to the small amount of the probe; the plant remains of the brick date to 147  $\pm$  302 B.C. (KN4355 = Nepal 1990/5). On the other hand, the final use of the hearth can be placed in the medieval period from the charcoal found in the depression, i.e. A.D. 1383  $\pm$  82 (KN-4359 = Nepal 1990/9). Remains of grain discovered in front of the hearth prove usage some 500 years previously, i.e. A.D. 812  $\pm$  112 (KN-4396 = Nepal 1990/11). Apart from a long period of usage, a possible explanation for the varying dates within one feature could be a secondary use of mud-bricks from storage structures for the hearth, or even the reuse of old humus in the mud mixture falsifying the date.

#### Location 19

Parts of a gallery once connecting the rooms survive on the rock-face in front of the aforementioned cave-chamber and the annex to the east. They consist of the remains of a dry-walling out of rock-debris in which wooden beams had been inserted, probably for a porch. Radio-carbon analysis helped to date the remains of one of the beams: A.D. 1242  $\pm$  46 (KN-4356 = Nepal 1990/6). The gallery, therefore, dates to the phase of occupation in the Tibetan medieval period,

which was also verified by the dates of the two rooms described previously. According to the features, the surviving projecting walls cannot have been built during the construction of the cave-system, as they obviously connected previously eroded cave-chambers, parts of which had collapsed (viz. locations 23 and 24 on the lower main floor). Nothing survives of the original porch which must have once existed and which dated to the beginning of the period of use.

#### Locations 17 and 18

The next chamber to the east contains well-preserved mud-brick structures. In part they survive to their original height of seven courses of brick. A single box-structure with a ground-surface of 50 x 60 cm and a depth of about 60 cm had a volume of some 180 litres.

In this room there are found further typical features constantly recurring in the chambers of the cave-systems. Approximately 20-40 cm above floor-level semi-circular niches have been worked to a depth of some 40 cm into the walls. They may have served for the setting-up of cult objects and belong to the final stage of usage, when the caves were used as living- and cult-quarters of lamas. The function as cult-niches is clearly demonstrated in other cave-systems, where the niches are correspondingly coated with mud-plaster and are painted.<sup>5</sup>

Besides these, an almost circular pit some 40 cm in depth and some 50 cm in diameter was present. It was filled with loose sediment and collapsed debris. Grain remains were found in the fill, probably as a result of secondary filling with material from the floor-surface.

#### Location 16

The neighbouring small room, which can be entered through a narrow breach, was completely filled with mud-brick structures. The south-

western part of the room with its entrance from the rock-face has been eroded away.

#### Locations 3 and 4

There follows a further larger chamber with brick-fittings along the north-west wall. During the first investigation by members of D.Schuh's team in 1987 an opening was made in the wall to the south-easternmost room of this storey, as it is difficult to enter the neighbouring chamber from the outside.

#### Locations 5 and 6

The easternmost room of the upper main floor has a area of only 2 m. The original, single entrance comprised a small, south-facing window of some 40 x 50cm. A small, double-chambered mud-brick structure had been built against the south-eastern wall.

### **Cave-rooms of the lower main floor of the south-eastern part of the F-System (Activity 90.2) Fig. 3 below**

The major characteristic of the rooms on the lower main floor is that they are in the majority partly covered with rock debris from the storey above. Having collected against the remaining sections of the gallery surviving in front of the caves, the debris then seeped into the rooms. The interior features are usually badly preserved, i.e. they have either crumbled away, apart from the lowest course of mud-bricks, or perhaps have been destroyed on purpose by visitors. The gallery as well as the filled-in area can be seen on the ground-plan (Fig. 3 below). The lower main floor is situated some 27 m above the river.

#### Location 22

The westernmost room of the lower main floor is

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only accessible by means of a small opening behind a ruined wall. It is, however, surprisingly large, with a row of collapsed mud-brick structures and a pit filled with debris consisting solely of grain remains and charcoal. Following the removal of the debris, the ground-plan is clearly discernible.

#### Location 2

In the adjacent small room only traces of the former structures remain. In the debris, however, the end of a bamboo arrow-shaft (Fig. 4,4) was found.

#### Locations 20, 21 and 23, 24

The two chambers following to the east have almost completely collapsed.

The next two caves survive rudimentarily, whereas a large part has broken away as a result of erosion and earthquakes. The black, soot-covered ceiling in the remains of cave 23 testifies to its earlier, long occupation. This, however, cannot belong to the final period of the cave-system, as the above-mentioned supporting wall of the gallery, which connected the chambers with one another, still survives on the rock-face. According to the preliminary investigations, the period of occupation of the cave-systems stretches over several centuries, whereas the gallery, as already noted and confirmed by a <sup>14</sup>C-date, belongs to one of the latest phases of use, as the original cave-chambers had been drastically altered by natural factors.

#### Locations 7 and 8

In the last of the rooms of the lower main floor examined a corner of the eastern wall had been filled in by a hard clay layer. The dried cracks indicated what a section through the extremely hard surface of the layer confirmed; it was a natural feature. At this deepest part of the room

water had gathered in the niche after the abandonment of the caves. Very fine particles had washed out of the mud-plaster, which had crumbled from the walls, and, after the puddle had dried out, the clayey layer had developed in several lenses. As a consequence of this, the floor had been sealed. Plant remains and finds proved this to consist of two surfaces divided by a make-up of rubbish some 20 cm thick. Here, too, the sediment layer upon the rock-surface was only some 30 cm thick. As well as floral remains, animal bones and the remains of firewood, leather and an iron arrow-head (Fig. 4,2) were recovered.

The ceiling of this room is also black with soot from the burning hearth. The usage as kitchen, however, certainly does not date to the final period of use, because mud-plaster had been applied afterwards to the sooted walls, which has since fallen away from the lower section of the walls. Unexplainable at present are irregular holes in the mud-plaster produced by four-sided wooden pegs, some of which are still in situ. Perhaps they served to fasten wall-hangings or similar on the cave walls.

### **Cave-rooms of the north-western part of the F-System (Activity 90.14)**

Since the upper rooms of the north-western F-System are situated much higher, so that they were much more inaccessible than the south-eastern system, it was hoped that they had suffered less subsequent disturbance. As a result D. Gebauer undertook an additional examination and a partial survey of this part of the F-System. An archaeological investigation took place in only one room of the system, i.e. the small room with the second highest entrance of the whole F-

System (approx. 52 m above the river). Gebauer also managed to take specimens from the highest chamber.

### Location 2: the room with the pottery deposit (Fig. 5)

This is a small, oval chamber some 4 m<sup>2</sup> large with mud-brick structures along the walls. One of these against the north wall still bears a flat slate lid. Further such slates lie in and around the structures. The varying dimensions of the mud-bricks testify to several phases of construction and reconstruction within the structures; behind them the rock-face is plastered with mud. The room's walls and ceiling in the south still display traces of the hollowing out with a slightly curved instrument with an adze-like cutting edge some 14 cm wide. The roughly rectangular access to the south-west also bears traces of a chisel-like tool with a cutting-edge about 1 cm wide, as well as the remains of mud-plaster.

Three complete vessels lay by the entrance to the chamber: a flask, which once had a spout, and two flat-bottomed pots, one of which had been repaired (Fig. 6). Besides these, two large pieces of a fourth, complete vessel, a large one with a narrow mouth, were found lying in a brick feature on the north wall. On cleaning off the entrance area, a pottery bung belonging to the vessel in the neighbouring feature was found in front of the first mud-brick structure, of which only two courses still survived.

Two mud-brick structures against the north-west wall survive intact; they comprise seven courses of mud-bricks in addition to the lid. To the east lies a 60 cm wide feature delimited on the south only by a single course of mud-brick; in it lay the large

vessel with a mend on the shoulder (Fig. 7). The cracks in the vessel had been carefully held together with string by boring into the sherds, threading a woollen string through the holes and smearing the crack with resin. The bung-hole in the wall directly above the base proved the vessel to be a chang-vessel, i.e. a vessel for brewing barley beer still in everyday use today. Owing to the repair, however, it was used secondarily as a storage vessel. In falling it had broken beneath the mend; as mentioned above, two sherds lay in the porch alongside the three small vessels, whereas the bung also lay in the porch, but directly against the neighbouring wall.

After recovering the three small vessels from the entrance, remains of a hearth appeared in the plan beneath the pottery deposit. In the sediment were found the remains of plants and utensils. Beneath it lay the natural rock.

The charcoal from the hearth provided a calibrated <sup>14</sup>C-date of A.D. 1443 ± 62 (KN-4351 = Nepal 1990/1), which certainly dates the final use of the room and the depositing of the vessels. The trodden surface of straw beneath a slate in the demolished structure next to the chang-vessel, however, produced a much older date, which pushes back the beginning of occupation and, therefore, the construction of the chamber way into the prehistoric period: 289 ± 68 B.C. (KN-4360 = Nepal 1990/10).

### Location 3

The small overlying chamber, which nowadays serves as an eyrie for nesting vultures, was only visited by D. Gebauer and D. Schuh. The <sup>14</sup>C-specimens from the hearth in the lowest occupation level revealed a calibrated date of A.D. 811 ± 72 (KN-4352 = Nepal 1990/2). The possibly plausible hypothesis that the least accessible chambers could reveal the earliest traces of

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settlement was not confirmed by this dating.

## The Finds<sup>6</sup>

### Pottery

The major proportion of finds consists of broken settlement pottery, sherds of cooking pots and storing vessels. Only the small room in the north-western F-System (90/14, location 2) furnished a pottery deposit of four complete vessels. The large vessel with a bung measures more than 60 cm in height (Fig. 7). It is hand-made. It was repaired at the shoulder/body by boring the large sherds and threading with a rough string of goat's-hair, after which the crack was smeared on the interior with resin.<sup>7</sup> One of the three small vessels also has a repair (Fig 6,3). There are two very similar pots which have an incised decoration, one with a semi-circle (Fig. 6,2), the other with a triangle on the shoulder (Fig 6,3).<sup>8</sup> The flask with the broken spout has a base with a stand (Fig. 6,1); it resembles a bumpa.<sup>9</sup>

Among the other pottery, including the surface finds, a considerable variety of rim-shapes is easily discernible. Many vessels are articulated; they are mostly cooking vessels (Fig. 8; 9,3).

Upto now there has been no pottery chronology for the region; the relative chronology of the material is unknown. In creating a chronology <sup>14</sup>C-dates and stratigraphy will form the fixed points. It is certain, however, that all our pottery finds are older than the pottery which has been kept and which was produced upto 50 years ago.

### Metal finds

Metal artefacts are found more seldom. Worth mentioning is a simple, barbed iron arrow-head with a tang (Fig. 4,2).<sup>10</sup>

Besides this, there were found a strip of bronze, probably used as a fitting (Fig. 9,1), and a fragment of an iron knife-blade (Fig. 4,1).

### Finds of organic material

#### Animal bones<sup>11</sup>

Because of the semi-arid climate, not only durable artefacts such as pottery survive, but also objects of organic material such as bone, leather, textiles, wood and plants. The room with the vessel deposit (90.14, location 2) produced a spinning-whorl of deer antler (Fig. 10,2)), unspun animal hair and spun thread. A small bag made of animal hide was found in the same context (Fig. 10,1).

All archaeological contexts contain fragments of animal bones, mostly typical food remains from the fleshy bones of sheep/goat (e.g. ribs), sometimes with traces of cutting, as well as remains of cattle, yak and horse or mule.

#### Wood and botanical remains<sup>12</sup>

In all rooms examined there were found wood chippings and larger pieces of wood, partly with traces of cutting and/or of heat, which suggests the remains of fire-wood. Several types of coniferous and deciduous woods were identified. That cattle-dung was also used for fuel is proved by dried packs that were found in some rooms.

Notable objects of wood are the fragment of a

bamboo arrow-shaft and the wooden handle of a tool (Fig. 9,2).

Only the last 25 cm of the arrow-shaft survive (Fig. 4,4). Fine, longitudinal incisions were for the fixing of the feathers. Only one carved cam-barb survives, the other has broken away. The shaft had been cut off intentionally, as the cuts at the upper end of the fragment show. Bamboo does not grow in the Muktinath Valley and had to be brought from some 1,000 m lower down.<sup>13</sup>

The wooden handle (Fig. 9,2) is made of a soft wood and displays the negative shape of a four-sided tang narrowing downwards; it belongs to a tool.

The large amounts of plant remains, particularly from grain and from threshing, imply a use of the mud-brick structures as grain-stores. By the botanical examination the seeds and remains of 61 domesticated and wild species could be identified, e.g. three different sorts of barley, a type of wheat and two of buckwheat. In the case of the buckwheat, which may have been domesticated on the periphery of the Himalayas, this is an early piece of archaeological evidence for it. The domesticated plants were associated with the same wild plants as in central Europe. According to the first examination, the state of the pollen is good and portends well for additional results.

### Preliminary results

In order to disentangle the chronology of the cave system, it is first necessary to establish a framework of <sup>14</sup>C-dates in which the features and artefacts can be ordered. There are already several groups of dates:

From the Tibetan prehistoric period upto about

A.D. 800 from the mud-brick structures and grain remains:

1. - several dates B.C., the earliest from the 3rd century B.C.
2. - several dates between A.D. 550 and 820.

From the Tibetan medieval period:

3. - dates from the cave sediment, floors, charcoal, wood from the entrances: between A.D. 1200 and 1500.

A preliminary result of this first archaeological investigation is that the multi-storey cave-systems represent the remains of settlements inhabited or used in prehistoric and medieval times by an agricultural population. According to the <sup>14</sup>C-analyses, the periods of use go back more than 2,000 years. The storage bins of air-dried mud-bricks were built during the earliest phase of use. The final settlement layers that have not been removed date to between A.D. 1200 and 1500. Afterwards, the cave-systems were partly occupied by Buddhist hermits, as revealed by the painting and inscriptions in certain rooms. Thus, the first basis for the occupation chronology of the partially monumental constructions has been won.

The work in July 1990, however, represented only a preliminary archaeological investigation in a single cave-system, in order to gain an impression of the possibilities and problems in examining the cave-systems in Mustang. The systematic archaeological work within the framework of the Nepal-German-Project on High Mountain Archaeology begun in Spring 1992 will expand the data-base, not only in number, but also in the methods employed by incorporating different cave-systems and their environs into the investigation. By gathering together the results of the other scientists involved on the project, one can gain an insight into the prehistoric settlement in the high mountain region of Mustang, in an



area on the very edge of the human oecumene.

### Notes:

1. The work was initiated by Prof. Dr. D. Schuh and financed by the German Research Council.  
HMG Department of Archaeology and especially then General Director ai Dr. S. Amatya gave their support, for which we would like to extend our sincerest thanks.
2. The plans were drawn by D. Gebauer and T. Ruppel, the finds by S. Laub, A. Smadi and S. Hase, whom I would warmly like to thank. For the translation of the German text into English I owe thanks to C. Bridger.
3. G. Tucci, Journey to Mustang 1952. Kathmandu 1953/1977 (reprint).
4. The <sup>14</sup>C-specimens were measured by Dr. J. Freundlich and calibrated using the programme CabibETH, Vers.1.5b, Zürich 1991.
5. For instance, both cave-systems investigated in the spring of 1992 in the upper (Activity 92.5) and lower Muktinath Valley (Activity 92.17) included chambers with similarly plastered and painted niches.
6. The finds can only be described here but not analysed.
7. An analysis of the resin is still wanting. The string remains were analysed by Prof. Dr. A. van den Driesch.
8. Dr. C. Ramble pointed out to me that the incisions could have a religious impact. There are four types of actions which are symbolized by geometric figures:  
circle = zhi - peaceful  
semicircle = rgyas - expansive, spreading  
square = dbang - powerful  
triangle = drag - fierce, destructive.
9. This information I owe to Dr. V. Ronge, who also told me that the general appearance of the recovered vessels and their decoration is different from the pottery which is in use in Tibet nowadays.
10. Dr. C. Ramble saw a similar arrow-head, which is quite different from those in use nowadays, in the Thakali village of Syang south of Jomsom.
11. The examination of the animal bones was carried out by Prof. Dr. A. van den Driesch.
12. The palaeoethnobotanical examination of the macro remains was carried out by Dr. K.-H. Knörzer, the pollen analysis by Dr. J. Meurers-Balke with assistance from I. Cloß. U. Tegtmeier M.A. examined some specimens of wood.
13. Even modern-day arrow-shafts for archery competition are mostly made from bamboo, which is now all brought from Ghasa.

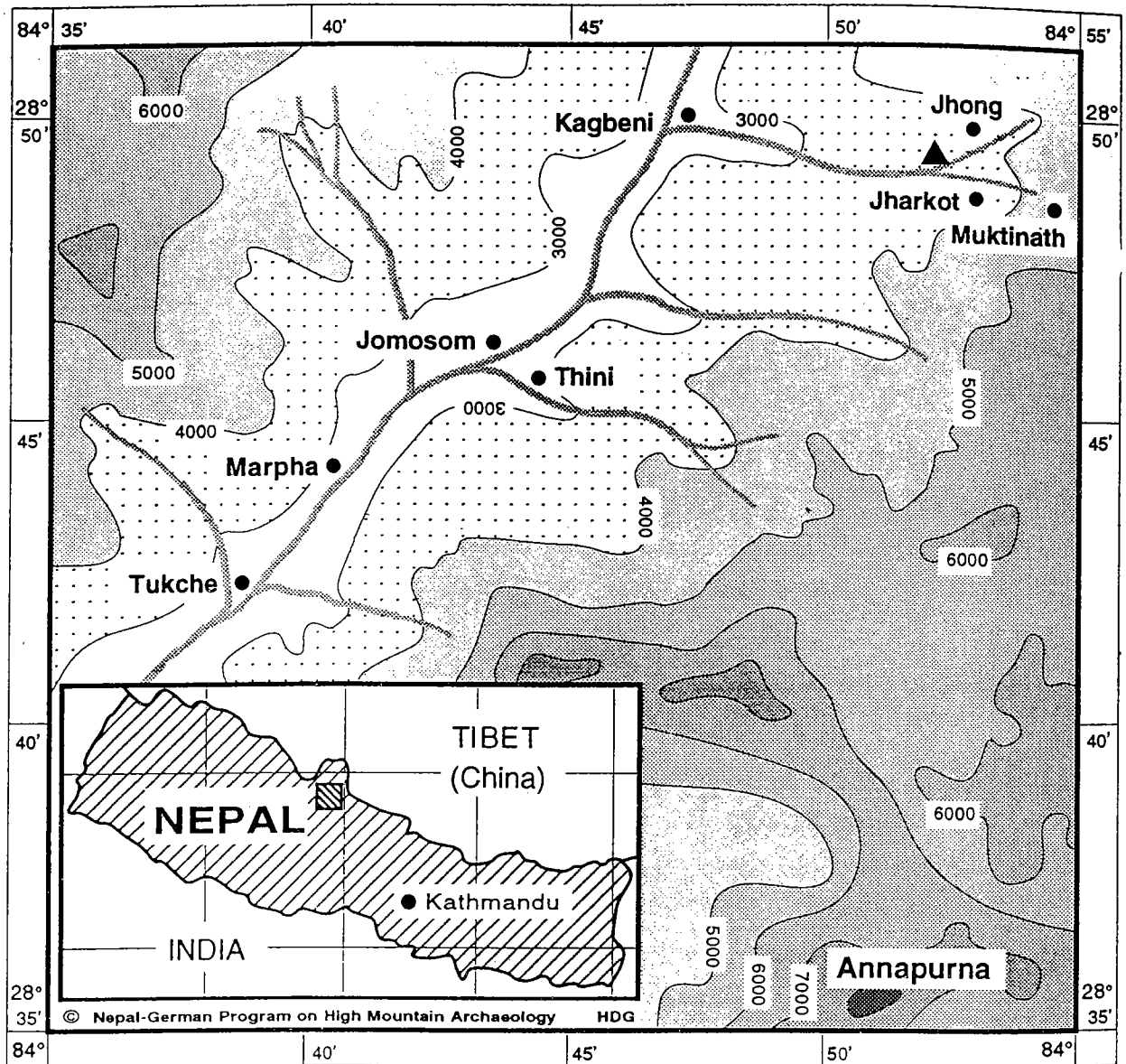


Fig. 1 Map of the southern part of Mustang District with the Muktinath Valley. The triangle marks the site.

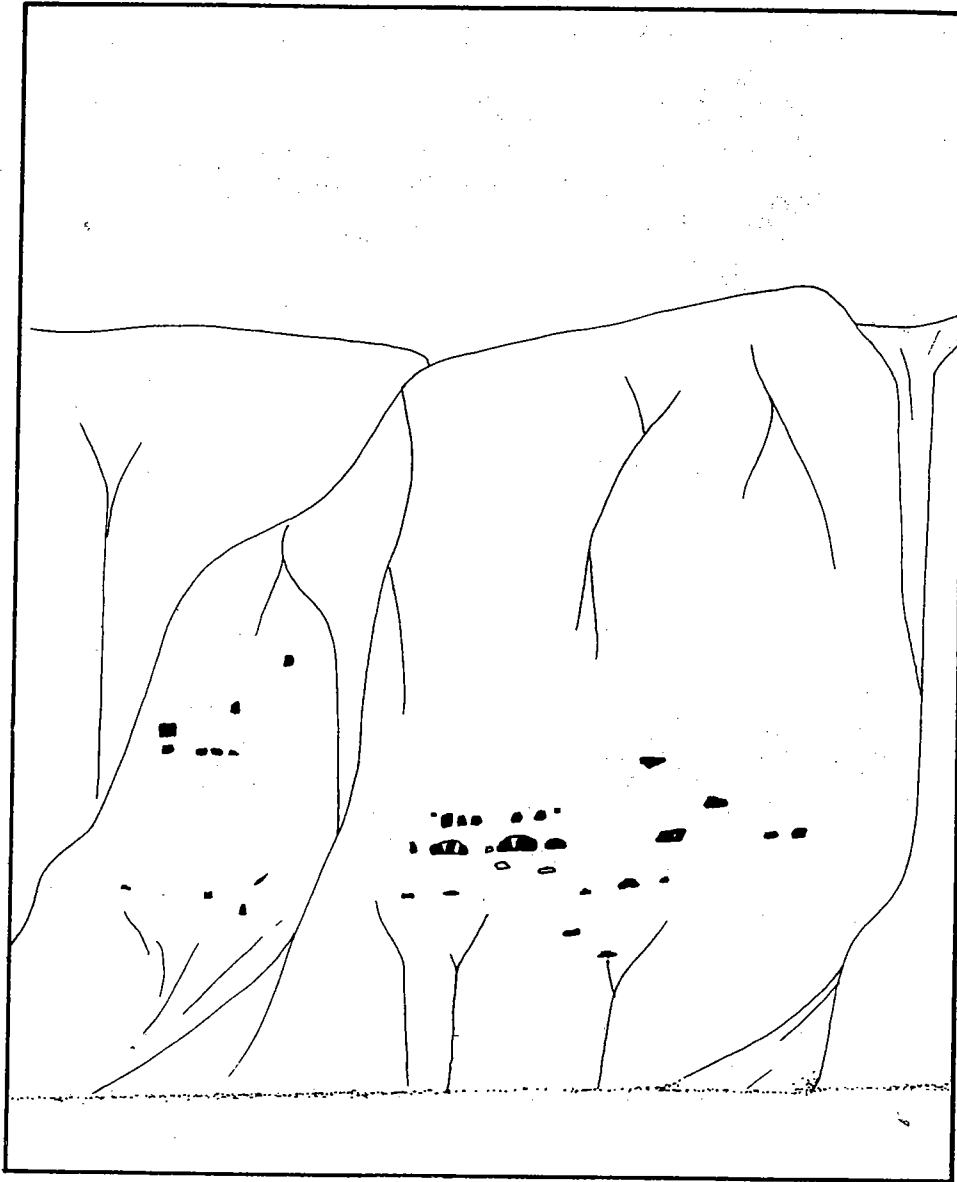


Fig. 2 View of the rock-face from the south with the examined cave system (F-System). Redrawn from a slide.

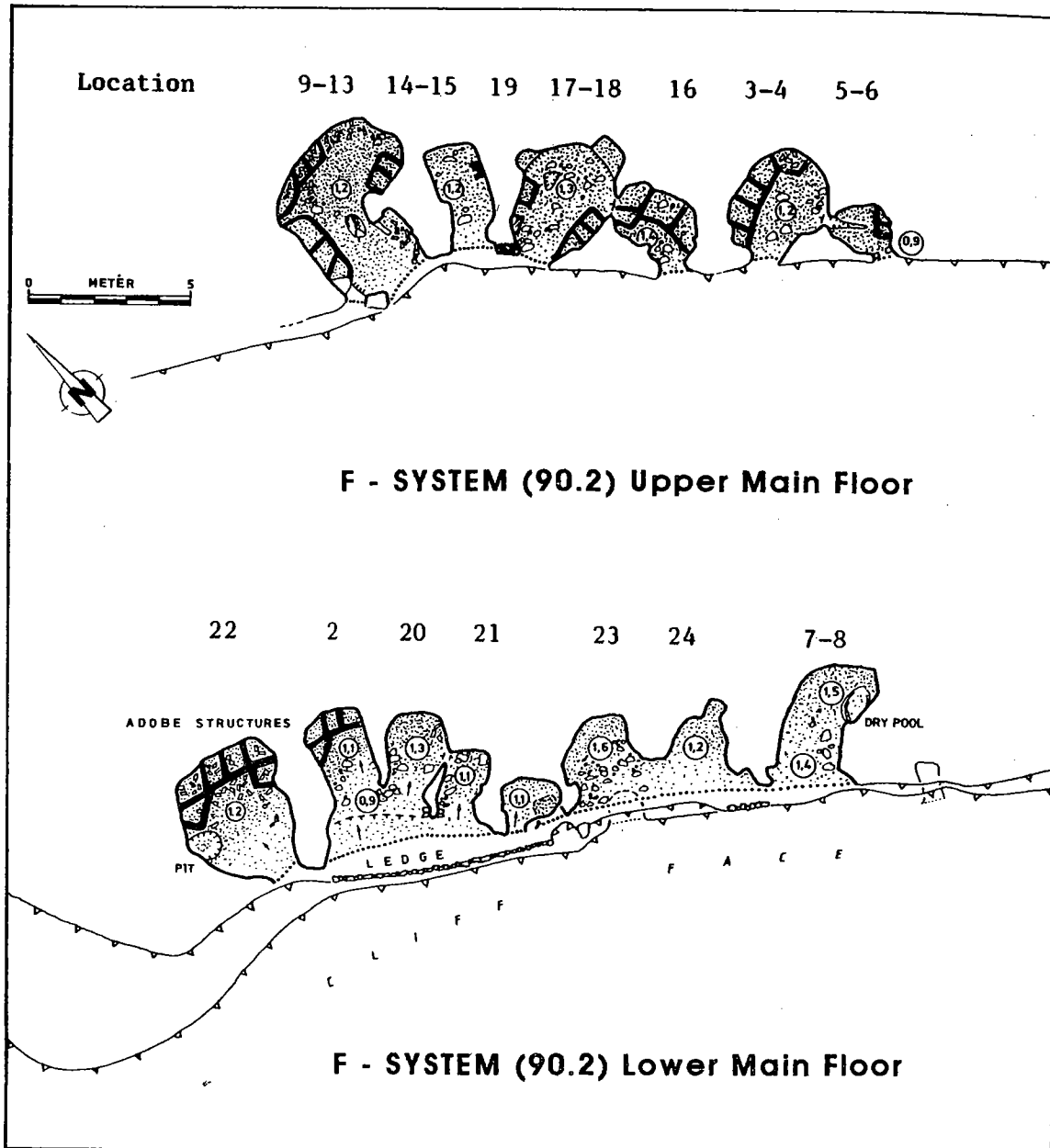


Fig. 3 Above: Plan of the upper main floor of the south-eastern F-System. Below: Plan of the lower main floor of the south-eastern F-System. Survey and drawing by D.Gebauer.

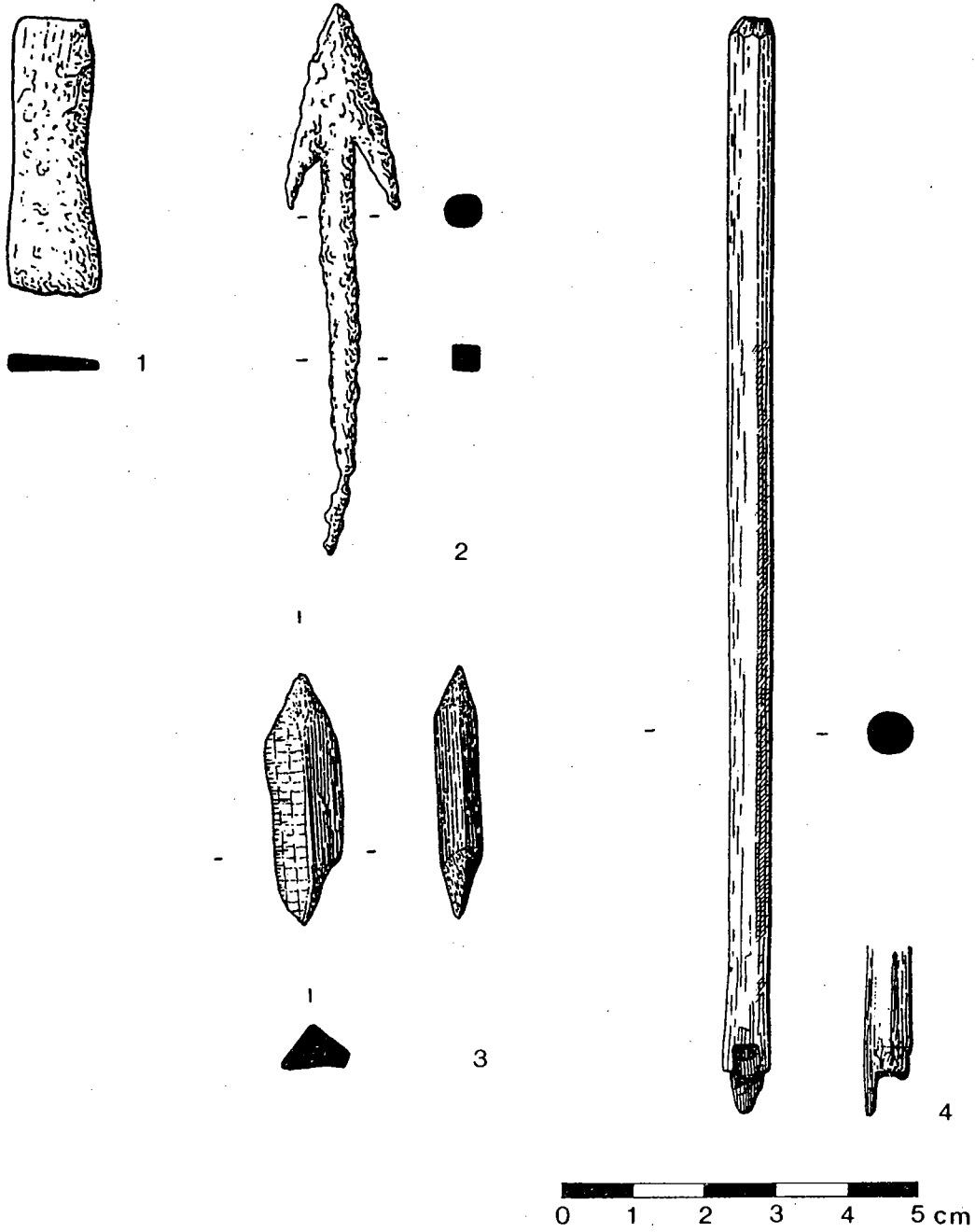


Fig. 4 Finds from the south-eastern F-System (90.2).  
1-2 Location 8 (iron); 3: Location 4 (wood);  
4 Location 2 (wood). Scale 1:1.

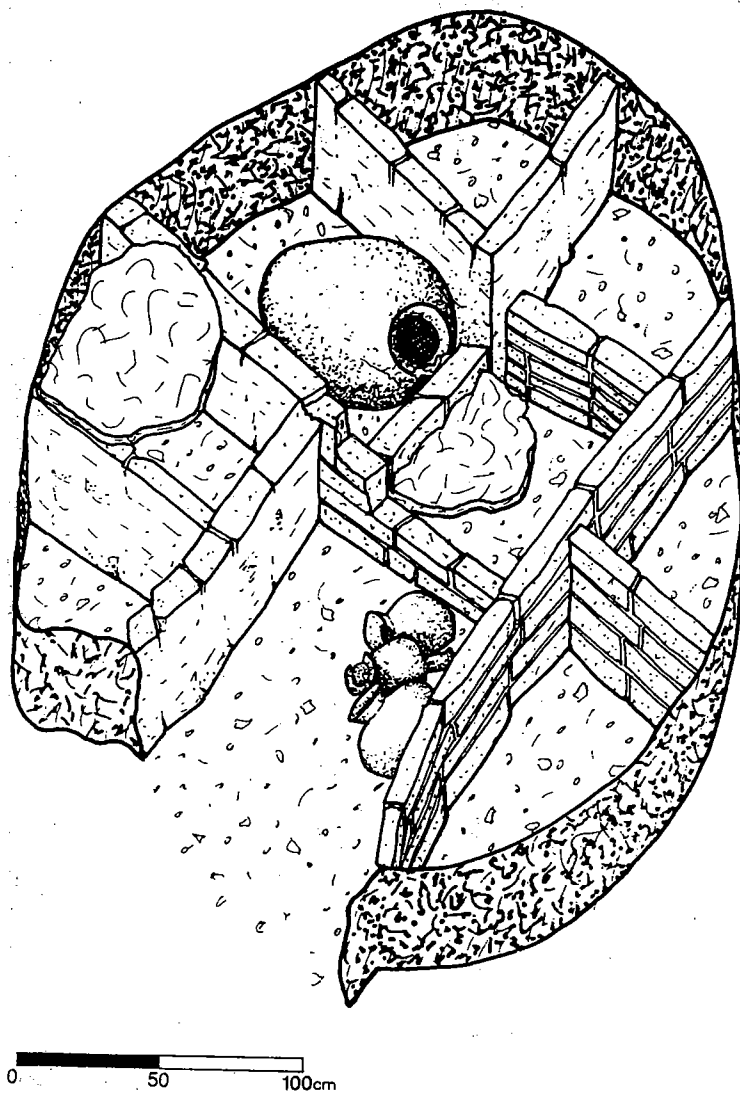


Fig. 5 Isometric view of room with pottery deposit in the north-west section of the F-System (90.14, Location 2). Scale 1:40.

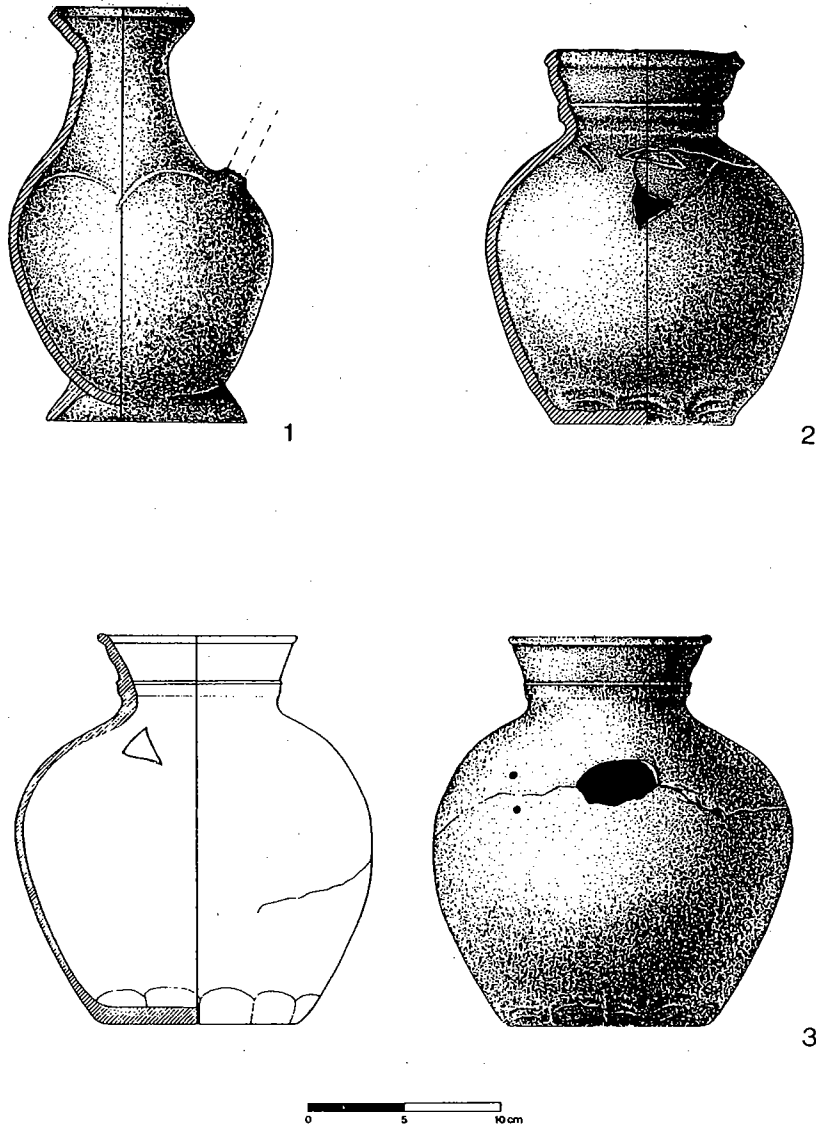


Fig. 6 The three smaller vessels from 90.14 Location 2.  
Scale 1:4.

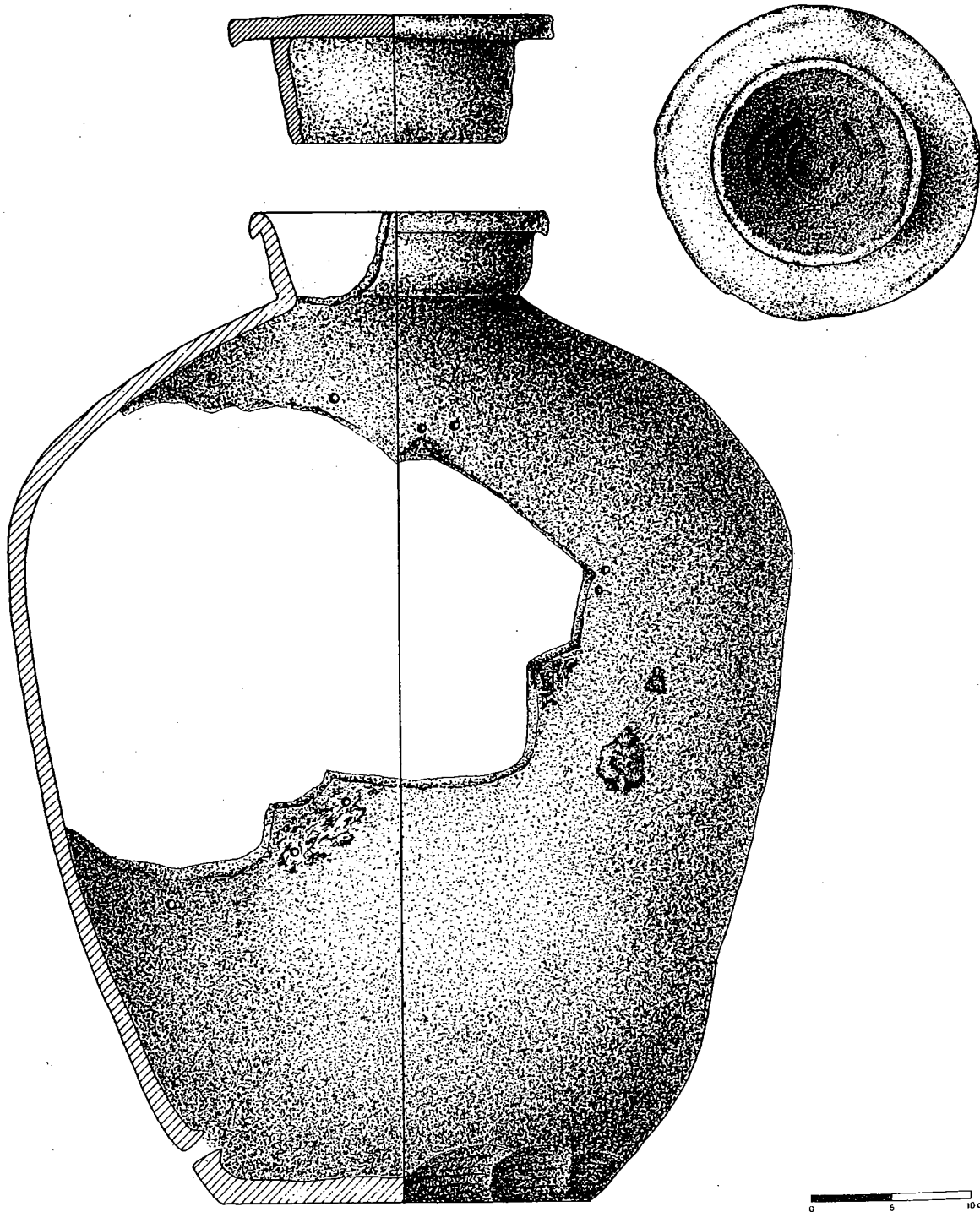


Fig. 7 The chang-vessel with bung from 90.14, Location 2.  
Scale 1:4.

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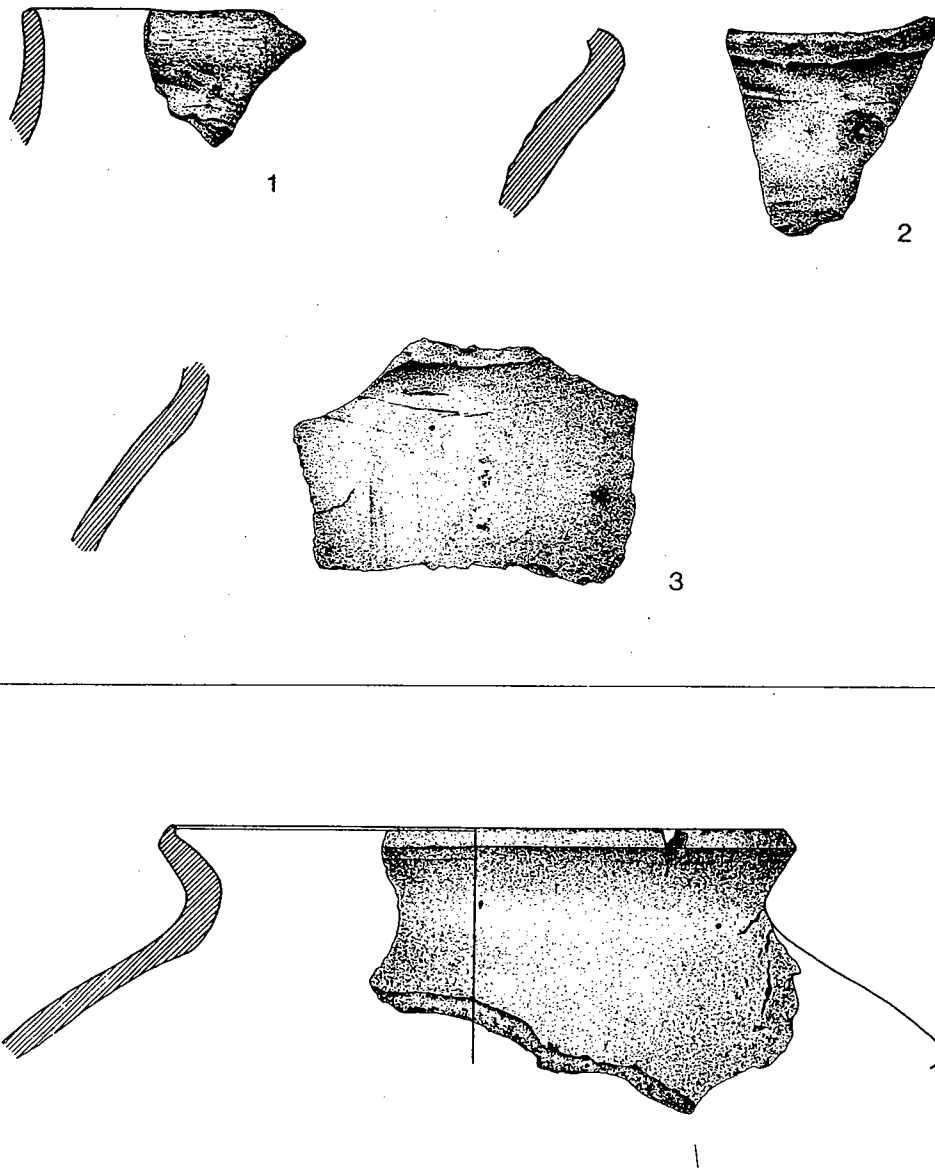


Fig. 8 Potsherds fom different locations: 1 90/2, Location 3;  
2 Location 11; 3 Location 12; 4 90/14, Location 2.  
Scale 1:2.

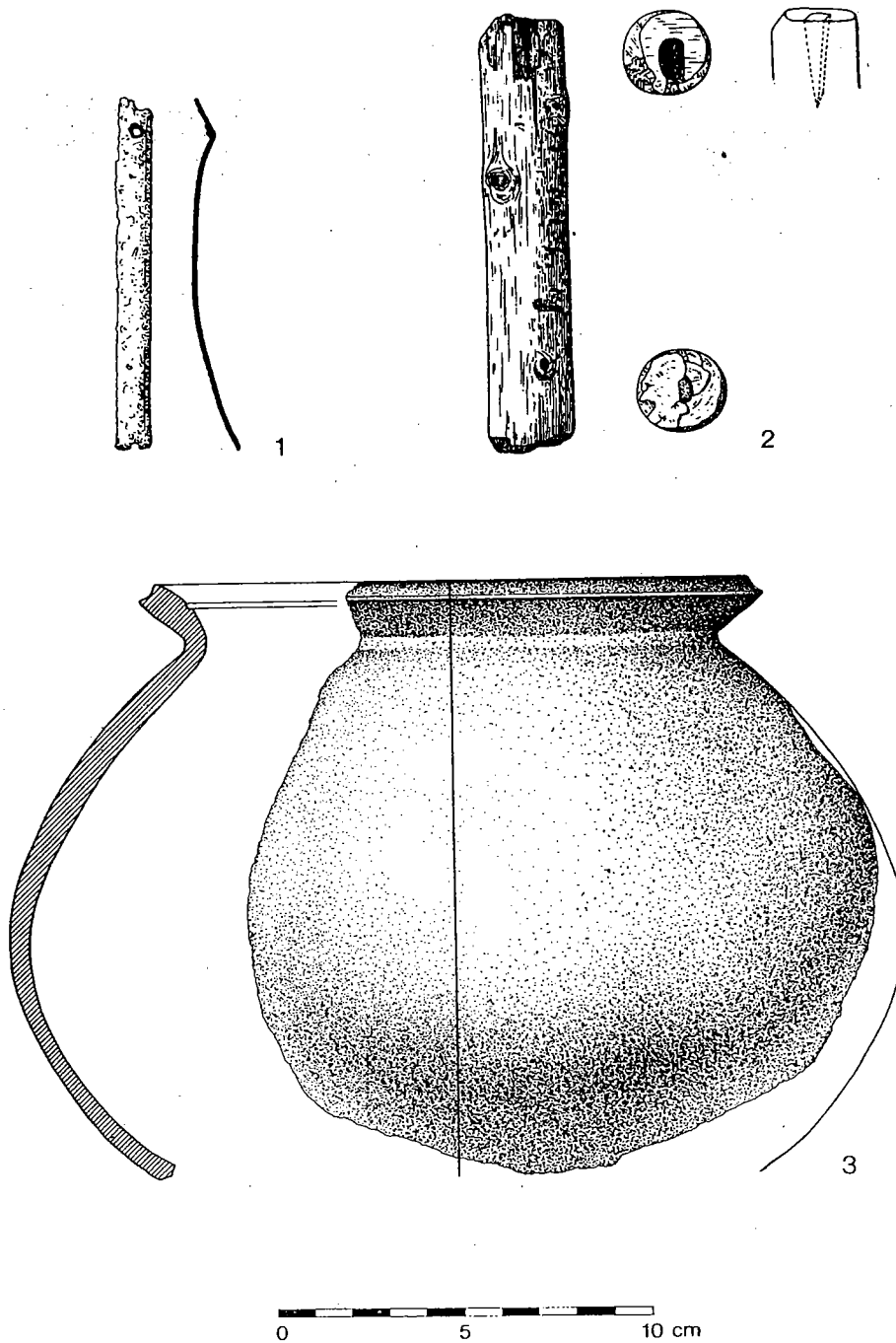


Fig. 9 Finds from the north-western F-System (90/14):  
 1 Location 2 (bronze); 2 Location 2 (wood);  
 3 Location 3 (pottery). Scale 1:2.

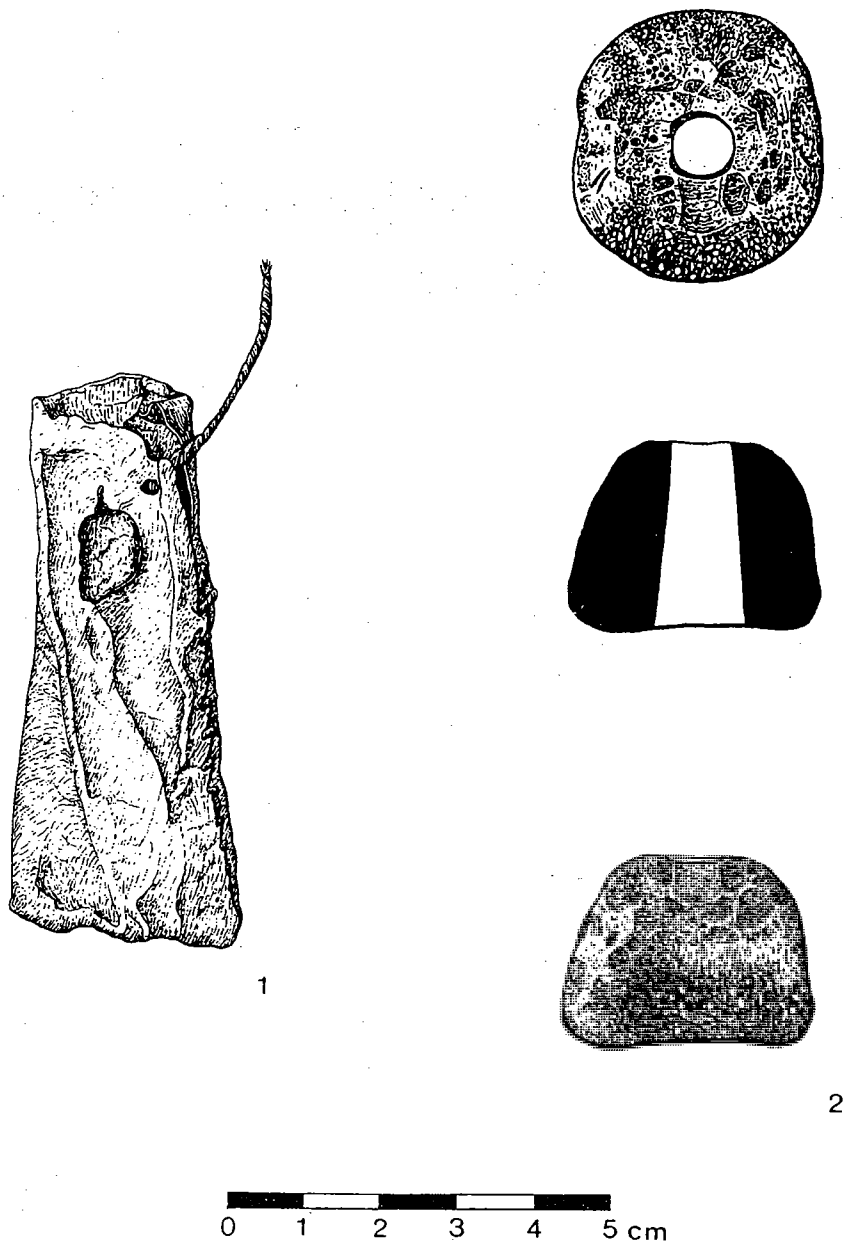


Fig. 10 Finds from 90/14, Location 2: 1 small leather bag; 2 spinning-whorl of antler. Scale 1:1.