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A Central Asian city on the Silk Road: ancient and medieval Merv

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In the 11th century AD, Merv was one of the world's largest and most splendid cities. Today it is a huge archaeological site, the complexities of which are being unravelled by the International Merv Project (IMP). Here the Director of the IMP charts the succession of cities that have flourished in the Merv oasis and describes the work of the project.

Perestroika and the opening of the former Soviet Union to foreign initiatives led in 1989 to the Institute's first involvement in the archaeology of Central Asia at the early neolithic site of Jeitun in Turkmenistan (described in the previous article in this issue). On the independence of Turkmenistan in 1992, a second collaboration, the International Merv Project, was agreed between the Turkmen Academy of Sciences, the Institute of the History of Material Culture (St Petersburg), and University College London, to work at the historic urban centre of the Merv oasis in the Kara Kum desert (Fig. 1). Since then, six seasons of surveys and excavations have been completed.[1]

The Merv oasis is the child of the Murghab River, which rises in the Afghan mountains, flows north across the piedmont into the Kara Kum desert and deposits its rich silts in a fan before drying up in the sands. The bed of the river is deeply cut into the piedmont, and the earliest occupation in the Bronze Age was in the north of the oasis, where the river flowed nearer to the surface. With more sophisticated irrigation, occupation gradually moved south, and by the mid-first millennium BC the urban centre had shifted to the south and east, where it was well sited for departures on the great trade routes. Its location reflects the importance of contacts with Iran, India and Central Asia. India could be reached by travelling up the Murghab Valley, and Merv was also well sited for the 180km march across the desert to ancient Amul (modern Charjew), a crossing point of the mighty Oxus (modern Amu-darya). From Amul it was an easy stage to Bukhara and points east, or upstream to Termez. Merv's strategic location was demonstrated as recently as the 1980s, when it formed one of the bases for the Soviet invasion of Afghanistan.

The city's location on the eastern edge of the oasis suggests that by the mid-first millennium BC, if not earlier, the Murghab had been dammed and the sophisticated irrigation system, on which Merv's agriculture depends, had been set in place. One of the aims of the International Merv Project is to study the irrigation history of the oasis. It has often been suggested that complex irrigation systems are prone to failure, with consequent salinization and

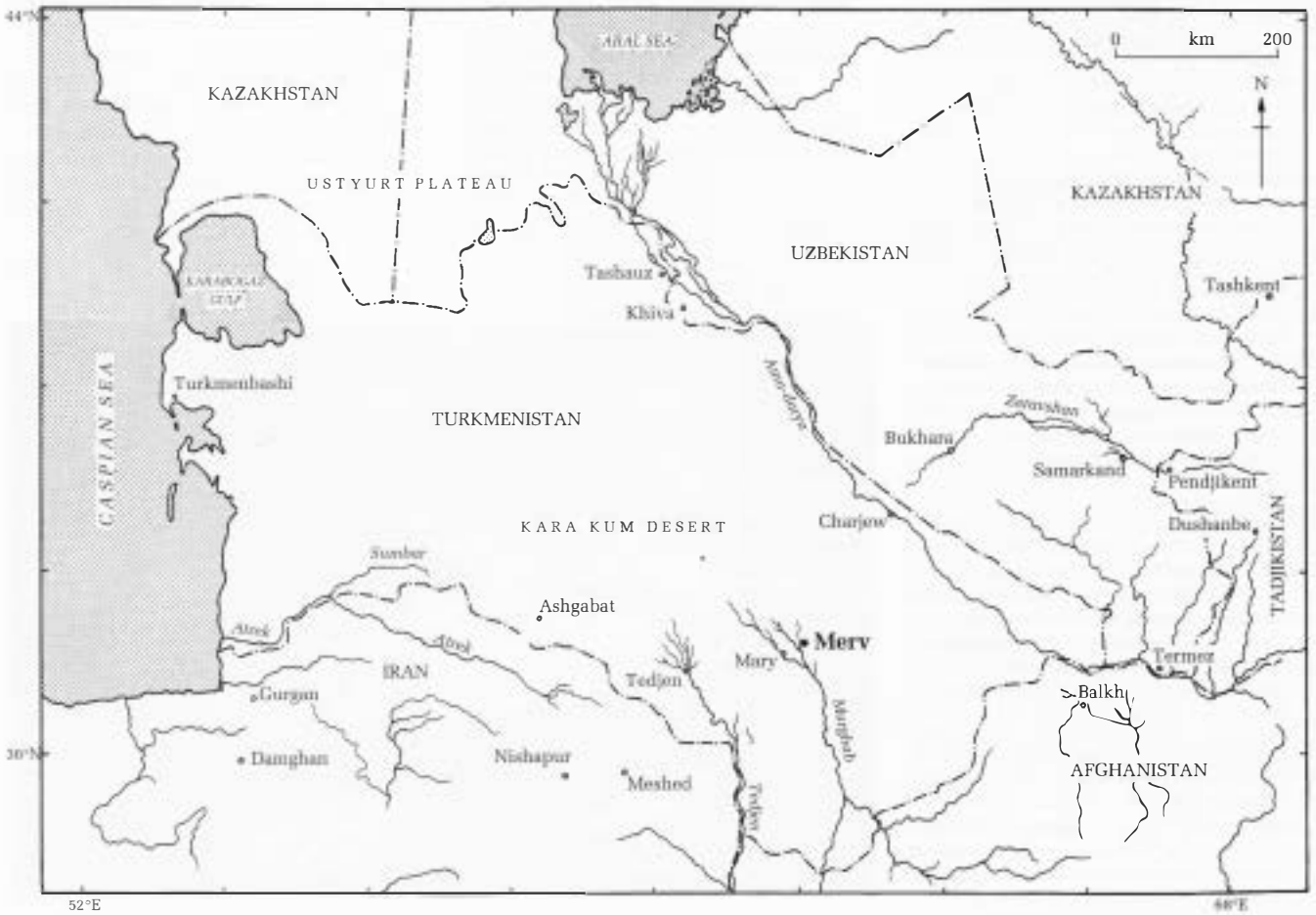

Figure 1 *Northern Iran and western Central Asia, showing the location of Merv.*

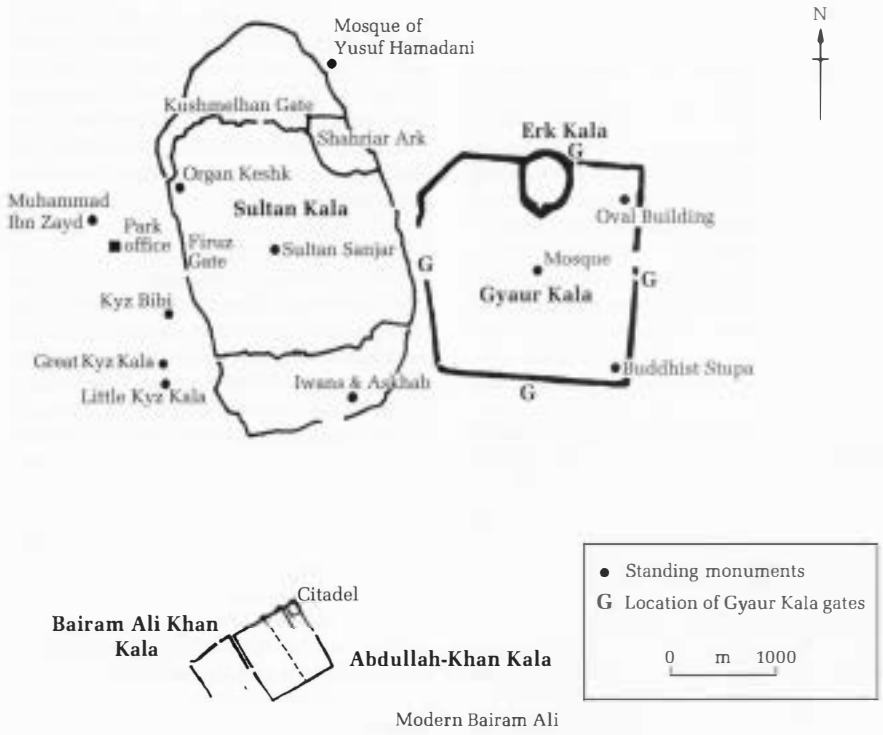

Figure 2 *The city sites of Merv. The earliest, Erk Kala, was probably founded c. 500 BC. Later it became the citadel of the Hellenistic city, Antiochia Margiana, known today as Gyaur Kala. The medieval city, known as Sultan Kala, was built on the other side of the main canal; and the post-medieval city, Abdullah Khan Kala, was built in 1409, with an extension, Bairam Ali Khan Kala.*

loss of agricultural potential. Because there is a series of adjacent cities with different archaeological periods near the surface, which can be sampled relatively easily, Merv provides a unique opportunity to study long-term land-use history. In addition, colleagues working elsewhere in this large oasis have allowed us to sample their sites, so in snapshot form our archaeobotanists have established a sequence of some 2500 years. Two particular questions that we are seeking to answer are the date of the introduction of cotton, long a staple of the Merv economy, and the degree of devastation caused by the invasion of the Mongols in AD 1221–22.

A succession of cities

The complex long-term pattern of urban development was one of the principal reasons for selecting Merv (Fig. 2). It is as if you had Roman London, Shakespeare's London and eighteenth-century London laid out on separate sites. Occupation has been continuous there from *c.* 500 BC to the present day. Not only do we have discrete and datable areas of settlement, but we have cities built on a flat alluvial surface, where topography has little effect on urban planning. Furthermore, the cities were walled, and so even at the grossest level they provide us with information about their size and form. It is usually possible to identify gateways, principal tracks, and the courses of some of the many canals that watered the cities. From the air it is possible to identify some of the patterns of the latest settlements within the cities. Even more importantly, these sites have been preserved by the Turkmen authorities who have placed them in an archaeological park. This opportunity of studying change through time, with remains near or on surface, applies to every aspect of our work – urban planning, military architecture, the ceramic and environmental sequences – and underpins our research strategy.

The earliest city was the polygonal Erk Kala, 20ha in extent, whose walls still stand some 30m high (Fig. 3). It was probably founded in the Achaemenian period, *c.* 500 BC. The Seleucids used Erk Kala as the citadel of the Hellenistic metropolis built by Antiochus I (who reigned from 281 to 261 BC), Antiochia Margiana, which continued in use for over 1500 years in the area referred to today as Gyaur Kala. However, in the final phases of its life, much of Gyaur Kala was turned over to industry because occupation had shifted to an extramural suburban development beside the Majan canal. This became the medieval city, known today as Sultan Kala, which was walled by the Seljuk Sultan Malikshah (1072–92). At its largest, it occupied some 630ha and was one of the capitals of the Seljuk empire. The next city, Timurid Abdullah Khan Kala, sited some 2km to the south, was built by Shah Rukh in 1409 and lasted up to the Russian annexation of Merv in 1884.

The ancient cities[2]

The great size of the city sites of Merv means that traditional archaeological techniques are of limited value, not only because of finite time and finances, but also because of the sheer scale of the problem. We initially planned to confine our efforts

Figure 3 *Aerial view of the ancient and medieval cities. Erk Kala, with massive mud-brick walls, is in the foreground with the medieval city behind. The twelfth-century AD mausoleum of Sultan Sanjar can be seen top right.*

Figure 4 *The cross on this mould, made from a re-used jar handle, was found during excavations of a sixth to seventh century AD house in Erk Kala. It provides the first archaeological proof of the presence of Christianity at Merv, well known from the literature.*

to the ancient cities of Erk and Gyaur Kala, themselves some 2 km^2 in extent, and undertook a programme of topographic, geophysical, geoarchaeological and surface artefact surveys, together with an excavation of an elite house within Erk Kala. Several phases in the life of this large mudbrick house have been unravelled, with frequent levelling of floors, door blockings, patching of old walls and construction of new ones. It has been dated to the sixth–seventh centuries AD (the time of the arrival of the Arabs) by the hundred or so small bronze coins found in the excavation, almost all of which were minted at Merv.[3] Other finds include documents recorded on pottery sherds (ostraca) and on pieces of bone, written in a variety of languages, usually Middle Persian but including Sogdian and even a few Bactrian letters – which suggests that the house might have been a scribal school. Another significant find is archaeological confirmation for the presence of Christianity at Merv in the form of a reworked jar handle, used as a mould for casting pendants in the shape of crosses (Fig. 4).

For our second excavation we chose a large low mound in the lower city, Gyaur Kala, selected because the surface artefact survey suggested that the uppermost levels belonged to the Middle Sasanian period and thus would complement the sixth to seventh century sequence of artefactual and environmental evidence from Erk Kala. We began by undertaking an extensive scrape, which revealed an area of alleys and dense housing, and we are currently concentrating on excavating one of the houses. The predicted Middle Sasanian date was confirmed by bronze coins, dating mostly to fourth-century kings, such as Shapur II and III, but with a few from the fifth century.

Analysis of the ceramics of Merv poses particular problems. Most wares were made from local clays, so their fabric does not change, and until the Islamic period they were unglazed. Shapes do change but not dramatically and not across the range, and it is one of the many truisms for archaeologists of the oasis – and of other areas of this time period – that ceramics cannot be closely dated for over a millennium. However, based on our stratigraphic sequence and on statistical analyses, changes between the fifth and sixth to seventh century ceramics are currently being established for the first time. These will allow more complete revision and re-analysis of earlier published and unpublished data from excavations at Merv itself, in the oasis and from our own 1992–94 surface artefact survey. It is a long-term aim of the project to establish a ceramic sequence across the time range of the cities.

Our third excavation was in an industrial area on the main platform of Gyaur Kala. This area had been identified by the surface artefact team because of many crucible fragments. It was the discovery of steel droplets in the glassy slags remaining inside the crucibles, found during analyses in the Wolfson Archaeological Science Laboratories at the Institute of Archaeology, that led to the excavation of this area. This resulted in the discovery, first, of two furnaces, the rims of which were just visible at the surface, and then to the excavation of the surrounding workshop and the recovery of a total of four furnaces (Fig. 5). Laboratory analysis has proved that the furnaces were used to produce high-quality steel by the co-fusion method, where wrought iron and cast iron are heated to some 1200°C in refractory crucibles. According to Arab writers, such as the twelfth-century al-Biruni, this produced excellent steel with attractive Damascus or watered patterning. This technique has not previously been documented in the archaeometallurgical record.

The medieval city

Working only in the ancient city failed to take advantage of the unique opportunities of the long near-surface timescale, which the adjacent city sites of Merv offer; nor did it address the time of Merv's greatest splendour, in the Seljuk period. The medieval city is roughly square and much the same size as Gyaur Kala, except for the suburban extensions to north and south (Fig. 2). However, the walls of Sultan Kala are less regular and they reflect a different pattern of growth, as the city began life as an extramural suburb and was not walled until the eleventh century. When Merv became the eastern capital of the Seljuk empire, the city expanded, and the standard histories state that it was Sultan Sanjar (1118–57) who walled the citadel and additional suburban areas to the north and south. The histories also describe how Merv died as a result of the Mongol destruction of the city in 1221 and was still almost entirely a ruin when Mustawfi visited it in 1340.

The problem is that archaeology does not agree with the historical records, for recent excavations by our Turkmen colleagues have suggested that there was considerable post-Mongol occupation. We have therefore initiated a research programme in the medieval citadel, which was mapped

Figure 5 *One of four furnaces of the earliest known Islamic metalworking foundry, used for producing steel by the co-fusion method, i.e. heating small pieces of solid wrought iron with cast iron to produce a workable, durable steel. The furnaces were found in a workshop area dating to the ninth to tenth centuries AD. (Scale bar: 20cm intervals.)*

in 1996 from air photographs, verified by ground survey. Surviving within it are the remains of several structures, the best preserved of which are all located on low mounds. They include parts of a surprisingly small palace, no larger than domestic structures elsewhere in the citadel, which had been identified as that of the Seljuk sultans. The combination of its size and height above present ground level suggested that the date proposed could be too early. We therefore began an excavation in a corner of a relatively destroyed courtyard house, most of which was subsurface. Excavations have so far distinguished three phases: a final squatter occupation, characterized by small hearths cut into fallen mudbrick; a second phase, probably dating to the Timurid period, with plastered gypsum floors; and a third phase, also post-Seljuk. This suggests that the standing walls in the "Seljuk" citadel may all be post-Seljuk. A deep trench in 1997 failed to reveal the expected Seljuk levels in this area of the citadel.

Military architecture

The state of preservation of the mudbrick fortifications of Merv is exceptional, and in 1996 we began a programme of recording the Seljuk defences. The walls cover about 12km in all and once probably contained some 316 towers, although not all have survived. According to historical records, there should be two phases of wall building, one by Sultan Malikshah (1072–92) in the late eleventh century and a suburban extension by Sultan Sanjar not much later; and two clear periods of building have been recognized archaeologically, an early "hollow wall" phase, followed by a "solid wall" period (Fig. 6). It would have been convenient if the latter matched the two historically defined phases. However, the site continued in use until the fifteenth century, when the third city of Merv, Abdullah Khan Kala, was built by the Timurid Shah Rukh in 1409, so the walls were presumably maintained until that time. Further analysis is required to establish their probable dates of construction.

The walls, which survive to a height of up to 5m, were flanked by semicircular towers spaced 20–30m apart, and fortified with large bastions at the corners. Because the early hollow walls were replaced by solid walls, this reinforcing and facing contributed to the preservation of the earlier walls, sometimes in a nearly pristine state. In the second phase the corridors and chambers were filled to form a solid wall. This evolution from a hollow to a solid wall would have required a complete refurbishment of the curtains and towers, including the rethinking of access to the walkway.

Work on the medieval walls should be completed in 1998, when work will also begin on the walls of the Timurid city, Abdullah Khan Kala, built in 1409 and in use until the nineteenth century. Preliminary examination of these walls also suggests two phases of construction.

Merv's unique sequence of cities allows us to take the story of the walls not only forwards but also backwards. Towards the end of the 1997 season a brief scrape on a section cut in a 1950s excavation in the southeast corner of Gyaur Kala suggested that major revisions should be made to the published account of the late Sasanian and Parthian walls. It had been suggested that Sasanian defensive walls used square or rectangular towers, representing a Central Asian rather than an Iranian tradition. This was disproved by the exposure of the substantial remains of a massive circular corner bastion, up to 9m in diameter. Excavation along the facade exposed the tops of five arrow slots. Arrow slots were also found in the so-called "Parthian tower", which prove the existence of unsuspected galleries within it, previously published as a solid construction. In 1998 we hope to continue work on these walls, which should throw new light on the well preserved Seleucid–Sasanian urban defences of Merv. When completed we should have established a sequence of military architecture covering more than 2000 years.

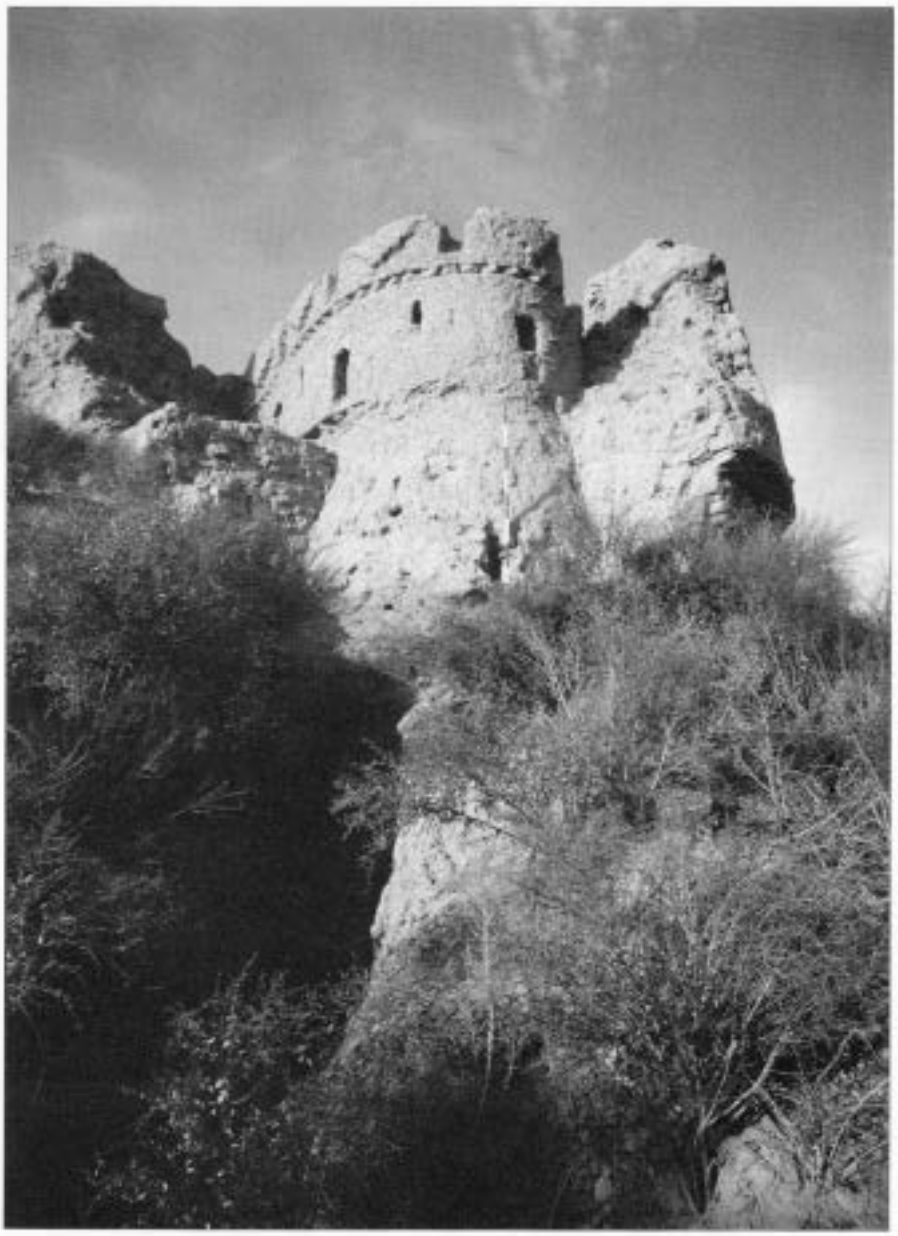

Figure 6 *Mudbrick medieval walls at Merv, built in two phases. The crenellations and arrow slots of the earlier galleried "hollow walls" were preserved by the second phase of "solid walls", when the walls were strengthened by filling up the galleries and building an outer skin, now sometimes partially collapsed. (Scale bar: 2m high.)*

Figure 7 *The Great and Little Kiz Kalas, two distinctive corrugated buildings or kushks of medieval Merv.*

Standing monuments

The project is also recording the standing monuments of the oasis, which today are under attack from the high watertable and salts eating away at the base of the walls (see Fig. 1 on p. 47), as well as from vegetation, wind and weather. Two well known examples are the Great and Little Kiz Kalas (Fig. 7), to the west of Sultan Kala. These great corrugated buildings, the most distinctive of the Merv oasis, may have been referred to in the tenth century *Hudud al Alam* or *Regions of the world*, which described Merv as a "pleasant and flourishing place" with "many kushks" or castles.

Merv is a site of major international importance that presents a unique archaeological opportunity. Despite the problems that such a large project entails, the cities need to be looked at as a whole, for it is the opportunity to examine their history through time that is particularly exciting. They provide an accurate reflection of the changing prosperity of the oasis: from the first millennium BC, the massive walls of Merv indicate its strategic military role; in Abbasid and Seljuk times, Merv was one of the greatest cities of the medieval world, famed for its libraries; and by Timurid times Merv's decline, initiated by the Mongols, had accelerated, as is indicated by the reduction in size of the city, which at least partially reflects the decline of overland trade in favour of maritime routes.

Notes

1. See Preliminary Reports on the first five seasons at Merv, by G. Herrmann et al., published in *Iran*, volumes 31–5, 1993–97.
2. See G. Herrmann, "The cities of Merv", *Proceedings of the British Academy* **94**, 1–43, 1997.
3. See reports on the coins found at Merv published by S. D. Loginov & A. B. Nikitin in *Mesopotamia* **28**, 225–41, 247–64, 271–96 and 313–16, 1993.