

■ UGANDA

Pre-Colonial Iron Production in Western Uganda: Recent Survey and Excavation

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Introduction

Bunyoro-Kitara, situated in modern Uganda, was one of several pre-colonial kingdoms which emerged in the Great Lakes region of eastern Africa during the second millennium AD. In these polities, the production or acquisition of iron, for the manufacture of tools, weapons, jewellery and ritual regalia, grew to be a central part of their economic systems. Bunyoro-Kitara itself was a major producer and trader of iron, and the success of this industry is believed to have played a highly significant role in its diverse economy, shaping the kingdom's influence in the region (Connah 1996; Tosh 1970).

Despite the large body of ethnographic data that exists for this part of Uganda, prior to this fieldwork comparatively little archaeological research had been undertaken. As a consequence of this, the operation of such iron production technologies remained poorly understood. Nevertheless, the large body of complementary ethno-historic and ethnographic data that discusses the local iron industries of the more recent past is one of the most valuable archaeometallurgical features of the area (e.g. Buchanan 1974; Childs 1998, 1999, 2000; Fisher 1911; Roscoe 1923). Building upon these resources, this research set out to examine in detail the Late Iron Age (LIA) iron production technologies of Bunyoro-Kitara, comprising the first study undertaken that specifically focussed on uncovering the archaeology of metallurgy there. This report describes the results of fieldwork conducted in 2007 as part of ongoing PhD research, and summarises six months of

survey and excavation across several areas of western and southern Uganda.

Specifically, the initial aims of the research were threefold:

- To undertake intensive survey to locate sites relating to iron production within three areas of the former Bunyoro-Kitara kingdom
- To excavate at ten of these sites in order to generate samples suitable for archaeometallurgical analysis
- To use the resulting data to reconstruct the smelting technologies employed at these sites

This strategy was employed in order to facilitate an examination of technological variation within, and between, smelting communities, and to explore the wider significance of iron production within the kingdom. This newly generated data could then be evaluated in conjunction with the existing ethnographic and ethno-historical data, allowing for a discussion of the relationship of these past craft specialists and iron production industries to the larger political entity within which they operated, as well as placing the results within a wider regional context.

Applied survey methodology

One of the initial tasks of the research was to determine the geographical areas to be covered by the fieldwork. Oral histories and ethno-historical accounts, together with information from previous archaeological research and information concerning clan histories and the origins of local place names, were examined as part of the preliminary preparations for the fieldwork in order to demarcate specific areas that were likely to have once constituted centres for past iron production (e.g. Buchanan 1974; Childs 2000; P. Robertshaw 1991, 1994, pers. comm. 2007; Roscoe 1923; J. Sutton pers. comm. 2006; Tantala 1989). Detailed background information obtained from these sources suggested that iron production activity was centred round the locales of Masindi, Kooki (in the district of Rakai) and Mwenge (in the district of Kyenjojo), and subsequently three survey zones were defined in these areas, as shown below (Figure 1).

It was important to develop a survey strategy that would be effective in locating sites within such densely vegetated environments, whilst remaining

Figure 1: Location of the three survey zones are indicated by squares. The sites of Kisanja and Kiwesi are also marked.

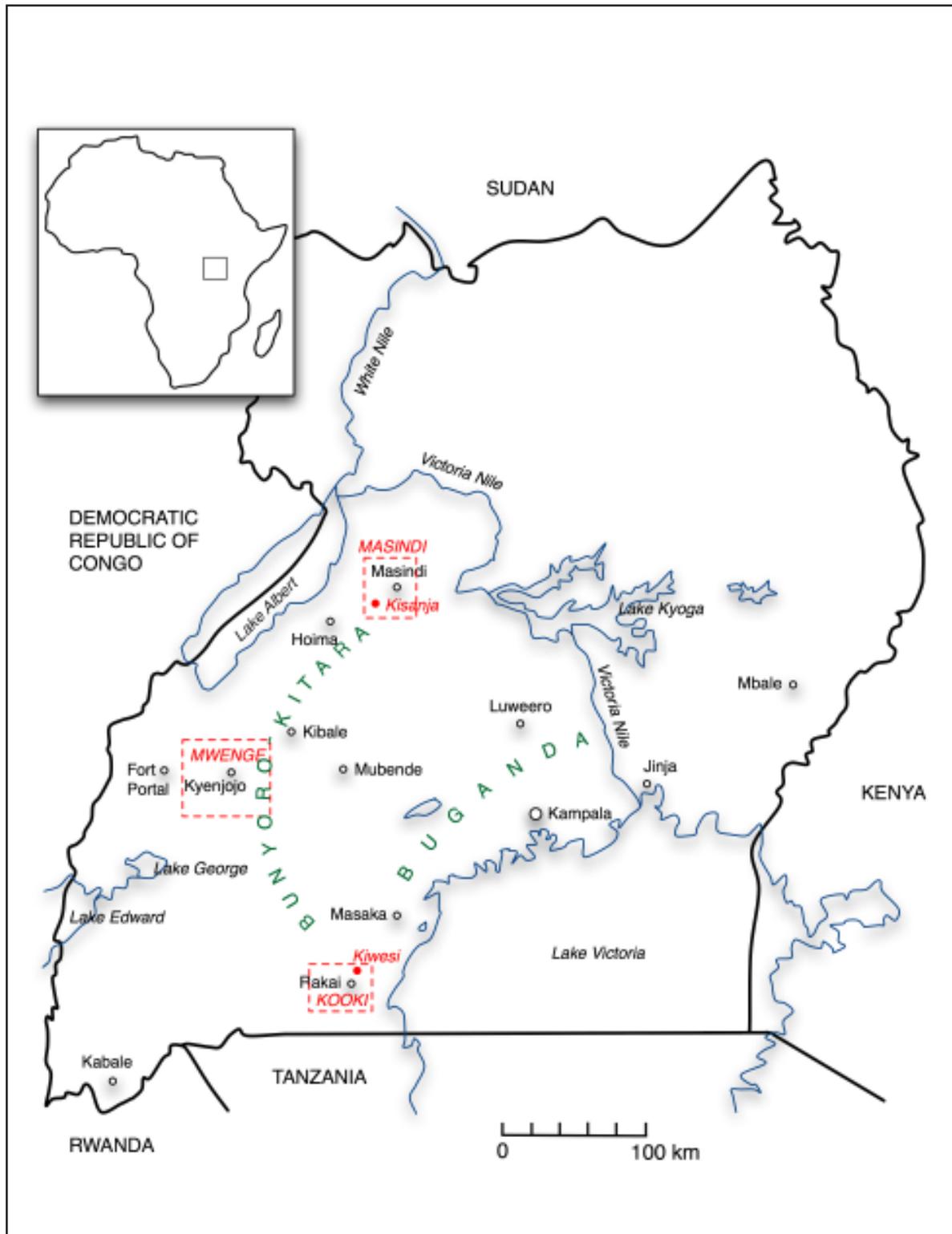
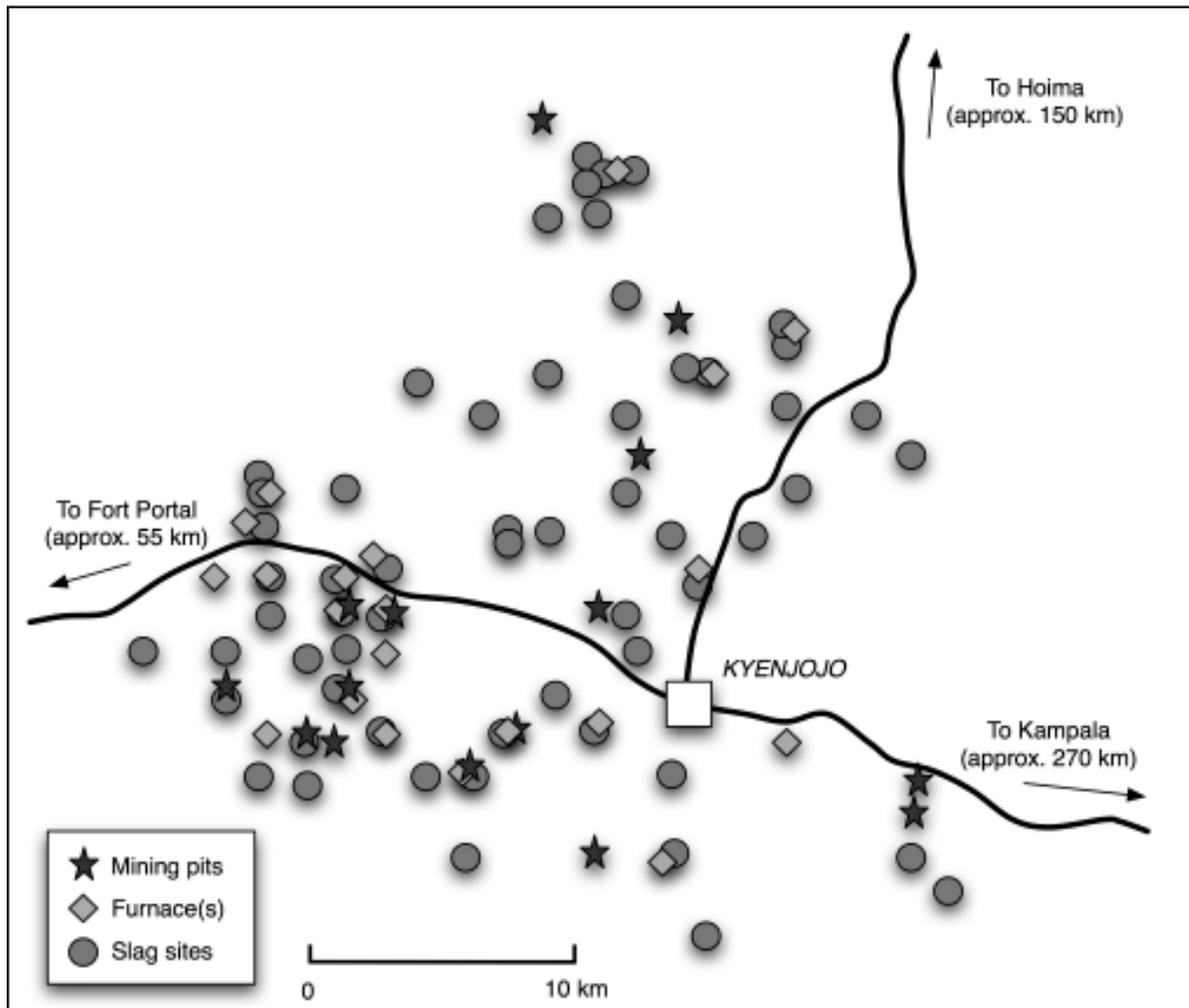


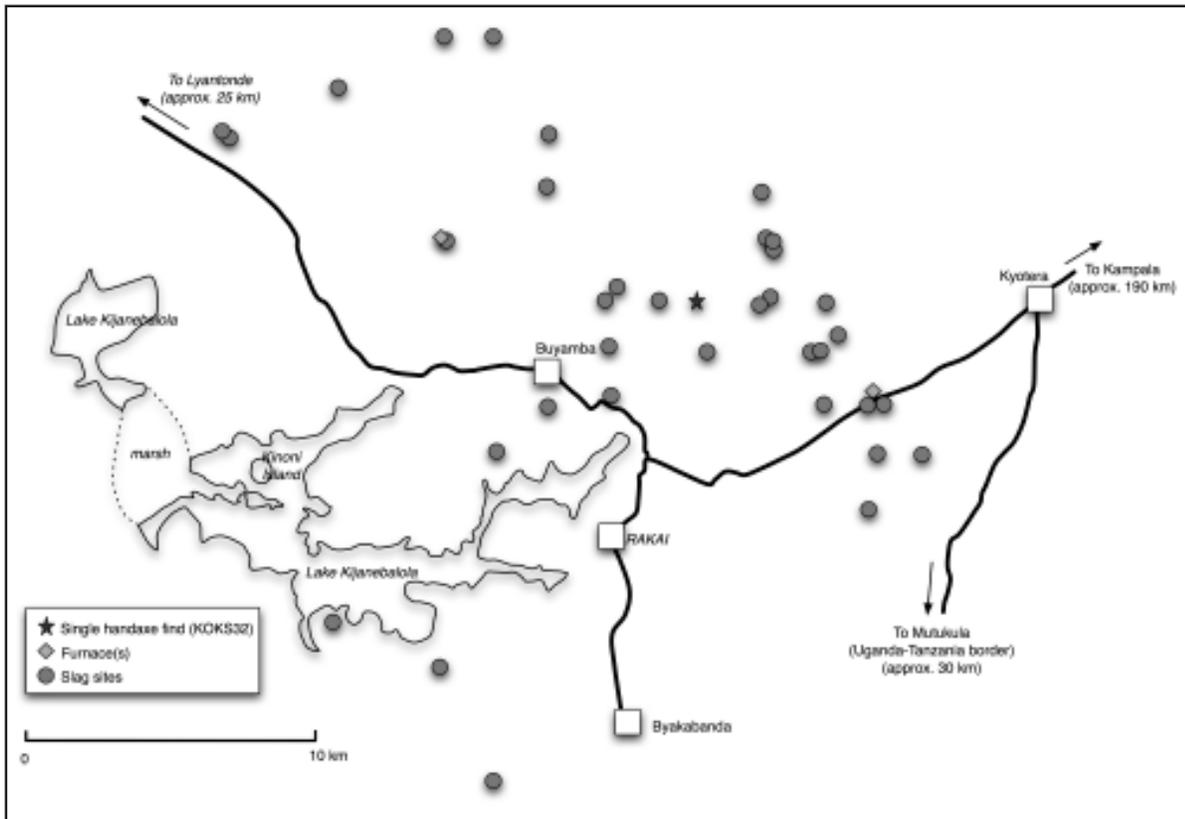
Figure 2: Sites found during the 2007 fieldwork in Mwenge.



sympathetic to the interests of local communities. Land-ownership issues are a major concern for many local people, and strangers walking across the land are often regarded as highly suspicious, and potentially a threat to the land itself. Learning from the survey-feasibility studies that had been carried out in western Uganda by Peter Robertshaw in the early 1990s (Robertshaw 1991, 1994), which found strict transect survey to be impractical in these environments, and from the recent survey carried out in neighbouring Rwanda by John Giblin (2008), a joint strategy was decided upon that combined a systematic, road-, track- and path-based survey with a more flexible, informant-led approach. These two complementary systems provided the most comprehensive cover possible for such an area, whilst maintaining maximum involvement of local residents.

Major and minor roads and paths within the survey areas were traversed by a survey team, as were areas of open land that were adjacent to a road or pathway. Exposed land and road cuttings were inspected for archaeological remains, and informal ‘interviews’ were carried out at habitation centres to enquire whether there were any known concentrations of slag or pottery in the vicinity. Once identified, each site was allocated a site code and a GPS location, and detailed information was recorded regarding the visible archaeological remains together with any additional local information about the site. Although this survey strategy was highly effective in locating new sites, it does not profess to present a data set that is representative of the patterns of past site location, as the main aim of this survey was to identify new sites related to iron production with high

Figure 3: Sites found during the 2007 fieldwork in Kooki.



potential for excavation in order to address the research goals of this project.

As expected, the most commonly encountered sites in each survey zone were slag scatters, due first to the high durability of slag as an archaeological material, but also to the fact that it often presents itself as a nuisance to local farmers when digging their fields, thereby making its presence memorable! However, a number of sites also included the remains of eroded furnace bases, and several sites were located that comprised iron-ore mining shafts. In total, 226 new sites were located across the three areas.

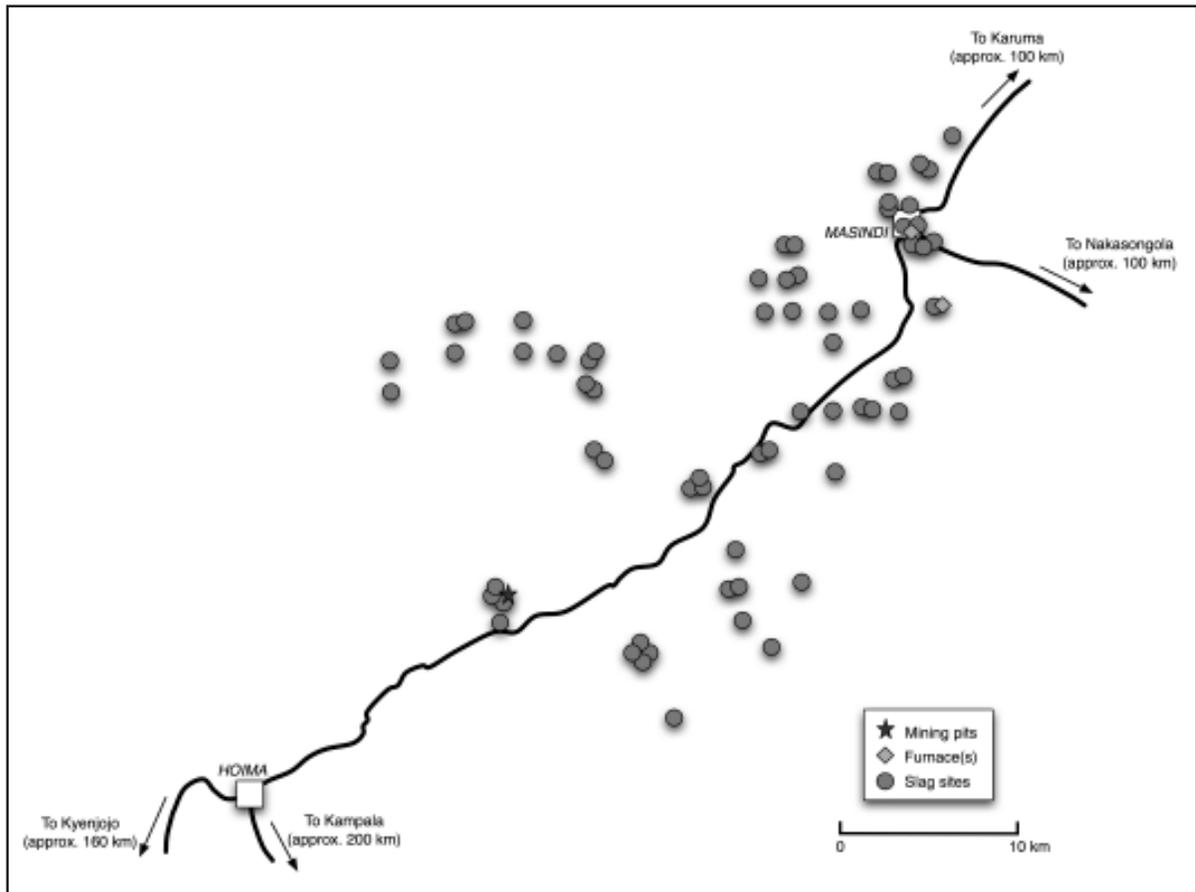
Survey results: Mwenge

The survey zone in Kyenjojo district covered an area of about 40 km by 40 km, encompassing all or part of the sub-counties of Katooke, Kyarusizi, Butiti, Bugaaki, Nyantungo and Kihuura within the county of Mwenge. Survey spanned from Kagorogoro in the west to Matiri in the east, and from Mirambi in the

north to Rweitengya in the south. In this zone, stretches of gentle hills were interspersed with patches of marshland and occasional pockets of dense forest, along with modern tree plantations for commercial logging in the northern and central-west areas. Extensive tea estates also covered much of the north and the west, which severely restricted the ground visibility in these areas. The protected forest reserves of Matiri and Kibale denoted the limits of the survey zone to the east and west respectively.

120 sites were found in this survey zone (Figure 2), and the greatest concentration of sites appeared to cluster around the modern town of Butiti. Eighty-five were characterised by large slag blocks, and 20 of these also included the preserved remains of iron smelting furnaces. Sixteen sites comprised concentrations of mining pits, whereas others comprised smaller scatters of slag fragments. Most sites were tentatively dated to the LIA using information derived from the decoration of associated ceramics, mainly knotted strip roulette (KPR – Soper 1985).

Figure 4: Sites found during the 2007 fieldwork in Masindi.



Several sites were located that revealed typical Urewe pottery (Posnansky 1961), which is generally understood to date to the Early Iron Age (EIA). However, such sites were not common during this survey, which fits with the understanding that there was very little early agricultural settlement in this region (Robertshaw 1994).

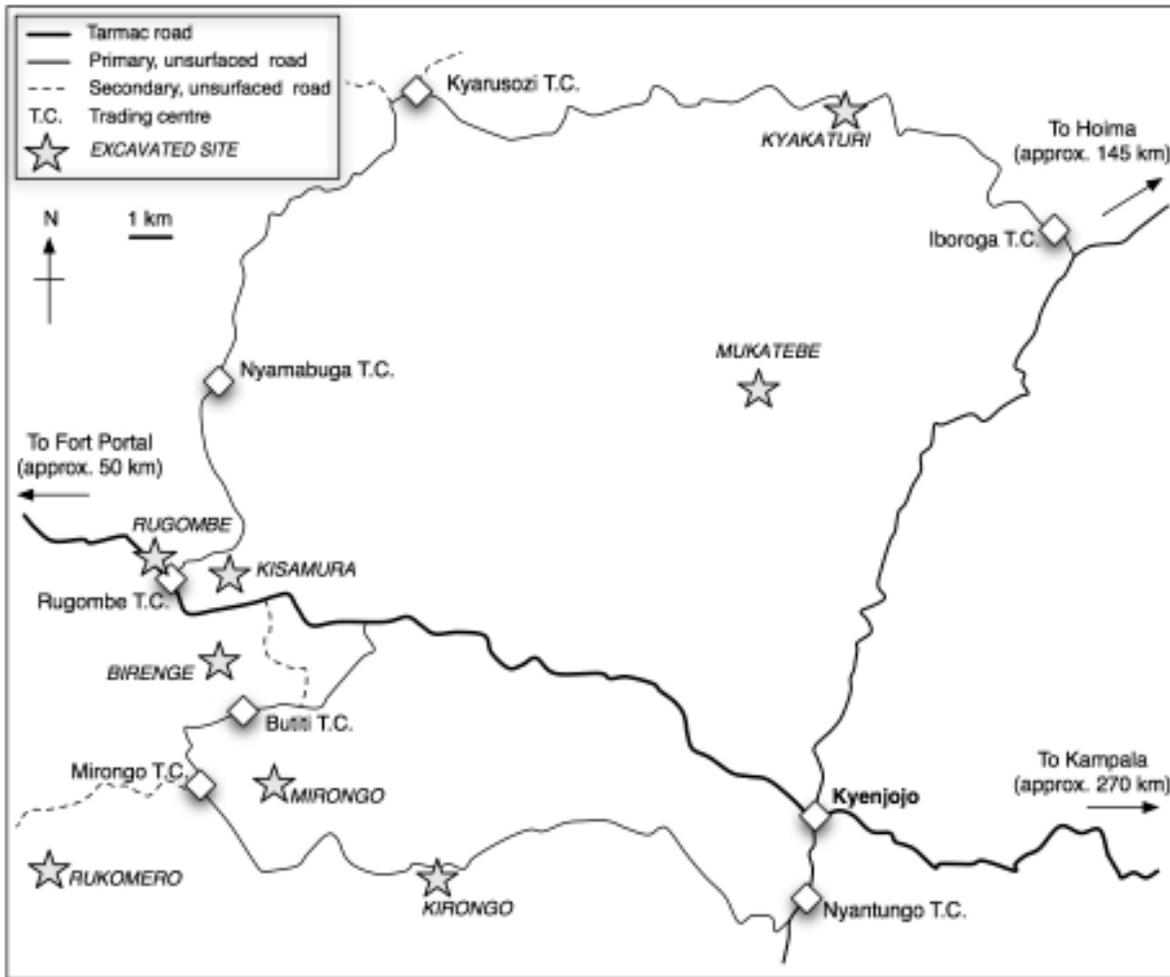
Survey results: Kooki

The survey zone in Rakai district covered an area of approximately 20 km by 30 km, encompassing all or part of the sub-counties of Kifamba, Byakabanda, Lwanda, Dwaniro and Kagamba within the county of Kooki. Survey spanned from Kinyabuddu in the west to Lwanda in the east, and from Lwendaula in the north to Kifamba in the south. The environment of the central area of this survey zone was dominated by Lake Kijanebalola, with as-

sociated sandy lakeshores and low-lying marshland. To the north of the lake, the setting quickly became much more dramatic, with steep hillsides culminating in large, flat, often bare, plains on top. Towards the south, a similar pattern occurred, with rocky outcrops and high, large hills, with the most southerly extent of the survey zone demarcated by a steep drop-off running east to west, linking the towns of Kalungi and Kifamba.

Within Kooki, a further 44 sites were located, most of which were characterised by large slag blocks, whilst others comprised smaller scatters of slag fragments (Figure 3). Two sites were found that contained traces of preserved furnace bases; one of these was notable for the presence of many small ditch features, which later were found to be dumping areas for slag and tuyères, as well as a well-preserved furnace base. All sites that were located in this area were also provisionally dated to the LIA.

Figure 5: Sites excavated in Mwenge during the 2007 fieldwork.



Survey results: Masindi

The survey zone in Masindi district covered an area of approximately 30 km by 30 km, encompassing all or part of the sub-counties of Budongo, Bwijanga, Karujubu, Nyangahya and Miirya within the counties of Bujenje and Buruli. Survey spanned from Katugo in the west to Kigulya in the east, and from Kigumba in the north to Isimba in the south. Dense, protected forest reserves in the northwest (Budongo and Masaba) and marshy areas to the southeast restricted the survey, but the major problem encountered were the prolific sugar cane plantations, mainly in the centre and to the west which proved impossible to survey. Many areas no longer cropped for sugar cane had been so in the past, with subsequent sub-surface disturbance caused by the

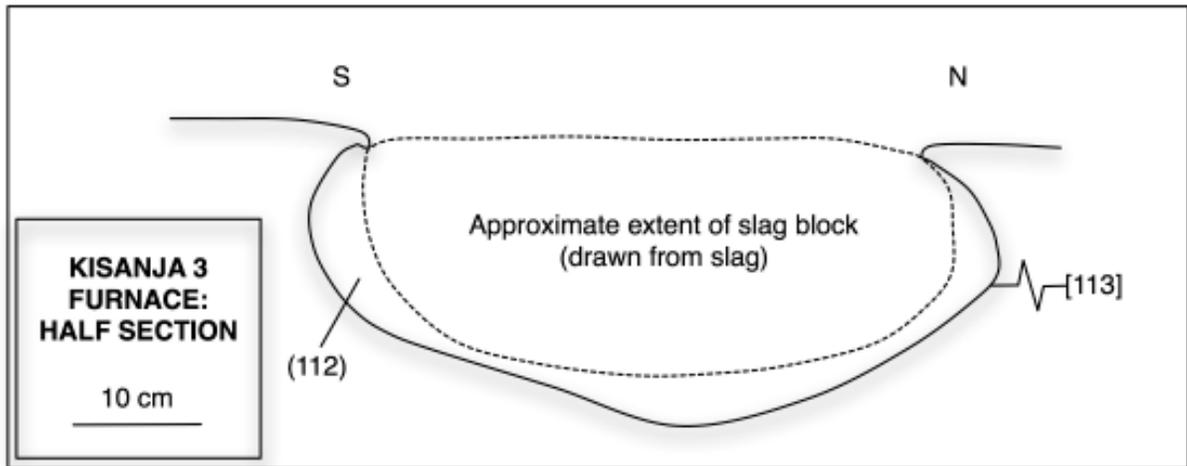
deep-furrowing tractors employed in this farming method. Nevertheless, this survey zone had the least imposing landscape, with gently rolling hills that were not much of an obstacle to either vehicles or walking survey.

In the Masindi survey zone, 59 archaeological sites were located, mostly characterised by scatters of slag fragments and pottery, with occasional furnace bases and a single iron-ore mining pit (Figure 4). Again, most sites were provisionally dated to the LIA.

Excavations and applied field methodology

Eight sites in the Mwenge area were selected for excavation, based on their relative geographical

Figure 6: Fully excavated furnace at Kisanja 3.



locations and their archaeological potential (Figure 5). Six of these sites (Rugombe, Kisamura, Mirongo, Birenge, Rukomera and Kirongo) were located within a 100 km² area in the southwest of the survey zone – the ‘core’ area where there was the greatest intensity of iron production sites – in order to assess the extent of variability in iron technologies within a limited geographical area. Further north, two additional sites outside of this zone (Kyakaturi and Mukatebe) were also excavated to extend the area under investigation, and to test variation on a larger scale. In the southern survey zone of Kooki, one site, Kiwesi (*cf.* Figure 1), was excavated, and in the northern survey zone of Masindi, the final site of Kisanja (*cf.* Figure 1), was chosen for excavation, thereby providing a cross-section of iron smelting sites from across the former kingdom. For the purposes of comparison, all of the selected sites across the three areas were characterised by a dominance of KPR wares, indicative of the LIA. However, radiocarbon dating will also be employed on charcoal samples recovered from all excavated furnaces to further refine this basic chronology.

The initial task on arriving at a site was to negotiate access and compensation with the landowner and local administrative officers, followed by a short introduction to our work that would be communicated to interested residents through a translator. A short, intensive survey of the immediate site area would then be undertaken, in order to locate all visible archaeological features prior to excavation.

Sampling of slag blocks was done on-site. Selected complete slag blocks were drawn, photo-

graphed and weighed and then half-sectioned using a sledgehammer. The resulting section was then drawn and photographed, and samples were taken from the top, middle and bottom of the block, representing the end, middle and beginning of that smelting episode. If the block appeared visually heterogeneous, further samples were taken from anomalous areas. This sampling approach will enable a detailed reconstruction of singular smelting events to be inferred from the analyses (*cf.* Humphris et al. 2009).

All excavated remains were removed from site to be stored at the Uganda Museum in Kampala, where detailed, non-destructive documentation was carried out on all samples. Representative samples of slag, tuyère and domestic pottery from secure contexts were selected, alongside furnace wall and potential ore source samples, in order to be transported to London for further analysis.

Analytical approaches

Archaeometallurgical analyses, employing a combination of optical microscopy, ED-XRF and SEM-EDS, are ongoing at the Wolfson Archaeological Science Laboratories, UCL Institute of Archaeology, and are illuminating the chemical compositions and internal microstructures of samples of the excavated archaeometallurgical material. Through these means, I hope to reconstruct the technical elements of these technologies (operating parameters, use of fluxes, material selection and so on), highlighting the choices made by past smelters in individual smelting episodes, and isolating specific technological styles.

The sites: Mwenge

- Rugombe (KYS54). The first features to be excavated in the Mwenge area were at Rugombe, a town just off the Hoima-Kyenjojo road. A single cluster of smelting slag blocks had been noted during the survey, alongside an isolated furnace base and what appeared to be traces of a large refuse pit. During the fieldwork these features were excavated, alongside a 2 m by 1 m test-unit, and samples were taken from seven blocks of slag. The furnace-pit was revealed to measure approximately 65 cm in diameter, and was 40 cm deep, with near vertical sides and a flat base. Further along the road towards Nyamabuga, an additional furnace base had been neatly, and conveniently, sectioned during recent road construction activity and was clearly visible in the newly exposed road cut. A 2 m by 3 m test-unit was excavated in the scrubland immediately above these furnace remains, to a maximum depth of 1.14 m, but no archaeological features were encountered.
- Kisamura (KYS45). At Kisamura, one furnace base was excavated, alongside three test-units. Sixteen slag blocks were recorded, twelve of which were sampled for further analysis. These slag blocks were particularly interesting as they were very uniform in size and shape, with an unusually tapered profile. The excavated furnace base, which measured approximately 75 cm in diameter, was very shallow, having been subject to heavy erosion due to the steep-sided nature of the site. Nevertheless, the surviving remains suggested a potentially different form of furnace construction than that encountered at other nearby sites, with substantial fragments of ceramic furnace wall remaining *in situ*, in contrast to a more typical thin furnace lining.
- Mirongo (KYS8). Several furnace base remains were identified at this site, one of which was excavated, in addition to two 2 m by 1 m test-units – one situated in the grassland immediately above the furnace remains; another in a nearby compound with dark, ashy soils that was rich in slag fragments. Three distinct clusters of slag blocks were also encountered, and from these, 21 slag blocks were recorded and fifteen were sampled. The fully excavated furnace base revealed a furnace pit measuring 75 cm in diameter and 35 cm deep, with near-vertical sides and a flat base – very similar in size and shape to that encountered in Rugombe.
- Birenge (KYS20). Two large piles of slag blocks, one containing approximately 300 large blocks of slag, the other roughly 100, were identified within the town of Birenge, indicative of large-scale smelting activity. These slag-heaps were fully recorded and documented, and 5% of the total number of blocks was sampled. Unfortunately, it was not possible to pinpoint any additional features in the vicinity of the site, and no excavation was undertaken here.
- Rukomero (KYS103). Two furnace bases were noted in the floor of a compound in Rukomero, and both were excavated, revealing furnace pits up to 60 cm deep and approximately 70 cm in diameter. Slag blocks were excavated from within the furnaces, but interestingly, no slag blocks were evident or known of in the immediate local area, although lenses of dark, ashy soils were apparent nearby. This lack of slag blocks may be due to their (relatively recent) sale and export to other nearby areas for use in construction. In addition to the excavation of these furnace bases, a 3 m by 2 m test-unit was excavated in another compound approximately 800 m to the east of the furnace remains. Although unrelated to the archaeometallurgical aims of this project, this location was rich in a variety of pottery types, and it was hoped that a stratigraphic sequence of pottery types might be encountered.
- Kirongo (KYS120). At Kirongo, one furnace base was excavated, situated in a compound directly beneath Kirongo Hill, where iron-ore was once mined. The furnace base that was revealed measured 50 cm in diameter and was roughly 30 cm deep, again following the pattern of near-vertical sites and a flat base. Two clusters of slag blocks were encountered in the immediate vicinity of the furnace, and from these fifteen slag blocks were recorded and eleven of them were sampled for further analysis.
- Kyakaturi (KYS59). At this site, which is the first of two sites to the north of the central Mwenge cluster of sites, a single furnace base was excavated that was visible in a small pathway leading between two fields. This furnace base was approximately 50 cm in diameter and 30

cm deep, and was filled almost completely with a single, large slag block. In addition to this, a 1 m by 1 m test-unit was excavated in a neighbouring compound floor that bore the remains of extensive iron production debris (slag and tuyère fragments). As well as the single large slag block that was excavated from the furnace, eighteen further slag blocks were recorded from the area around the test-unit, all of which were sampled.

- Mukatebe (KYS67). At the site of Mukatebe, a distinct lens of dark, slag and tuyère-rich deposit was noted in a fresh road-cut during the construction of a new road. A single 1 m by 2 m test-unit coming down onto this layer was excavated, although no features were located. Nineteen of the slag blocks that had been disturbed by the road construction were sampled.

The sites: Kooki and Masindi

- Kiwesi (KOKS17). In Kooki, a single site was selected for excavation. At this site, a large number of smelting-related features – such as slag clusters, furnace remains, and hollows and mounds containing smelting refuse – were found dispersed throughout a small village named Kiwesi, meaning ‘place of the smiths’. One furnace base was excavated, revealing a furnace pit that was over one metre in depth and a maximum of about 80 cm in diameter, tapering to a diameter of approximately 40 cm at the bottom. Further excavations were undertaken to investigate two additional features – a small mound and a small hollow – which were determined to be past dumping areas for the waste products of smelting. Fifteen blocks of slag were also recorded, all of which were sampled.
- Kisanja (MAS50). The final site to be excavated was Kisanja in Masindi. Here, two furnace bases were excavated, both of which were the smallest furnaces to be encountered during the fieldwork. The first, the furnace at Kisanja 2, measured approximately 45 cm in diameter and was 40 cm deep, with vertical sides and a flat base. However, the second furnace, a few hundred metres away at Kisanja 3, was of an unusual design. This furnace appeared to be 45 cm in diameter at the surface, but once excavated, this was re-

vealed to be the lip of a distinctive shallow, bowl-shape furnace pit, with the maximum bowl diameter actually measuring 55 cm at a depth of 10 cm below ground level (Figure 6). This shape bears similarities to furnaces described by Roscoe (1923) in relation to the royal smelters of Banyoro. Further to these furnace excavations, a 2 m by 2 m test-unit was excavated at Kisanja 1, revealing a dumping area of slag blocks. Finally, sixteen blocks of slag were fully recorded and sampled from this site.

Preliminary thoughts

Although the results of this survey were undoubtedly restricted by several unavoidable factors, such as variations in ground visibility and accessibility, a particularly high number of iron production sites were encountered in all three survey zones. This goes to reinforce the accepted view that iron production was a highly significant industry to Great Lakes kingdoms such as Bunyoro-Kitara in the second millennium AD.

From the survey and excavation results alone, it is already possible to begin to see patterns of variation and continuity emerging in the data. Broad variation is apparent between the three survey zones, as evidenced in furnace design and external slag morphologies and other macroscopic characteristics. From region to region, smelters would have been utilising varying raw materials for use in their smelts, and negotiating smelting techniques based on different bodies of technological know-how. Small-scale variation on a local level is also becoming apparent in some of the preliminary analyses, and also in the informal interviews that were carried out (Iles 2009). Nevertheless, within clusters of slag blocks from single sites, there is a tendency towards consistency in slag shape, colour and size, which is suggestive of a single smelting methodology being repeated time and time again within a specific timeframe. However, the ongoing analysis of the archaeometallurgical remains will be able to shed more light on the techniques employed and the organisation of such industries in this region. This will then allow for a more refined picture to emerge regarding the choices and influences of past smelters working in Later Iron Age western Uganda.

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