

# The spatial patterns of Tswana stone-walled towns in perspective

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Contemporary authors on African urbanism regularly repeat reports by early European travellers of large Tswana settlements with populations of approximately 20,000, apparently the same size as Cape Town at that time. These settlements, called agro-towns, unlike Mapungubwe and Great Zimbabwe, are mostly described in academic publications, while very few architects know what they really looked like. This article applies quantitative analysis to the plans of the ruins of certain distinctive Tswana stone-walled homesteads and villages by exploring the physical attributes such as size, shape, geometries, spatial patterns and land-use intensities. Sizes are subsequently compared with those of pertinent frontier towns of that period, as well as those of Great Zimbabwe, which are widely recognised and undisputed as urban entities. The purpose of the investigation is simply to enhance the understanding and appreciation of Tswana settlements, vis-à-vis contemporaneous European towns and those of the Shona some time earlier.

**Key words:** Tswana, agro-towns, stone-walled ruins, Molokwane, bilobial dwelling, *kgotla*

## Die ruimtelike patrone van Tswana klipmuur dorpe in perspektief

Hedendaagse skrywers oor Afrika stedelikheid herhaal gereeld verslae deur vroeë Europese reisigers van groot Tswana nedersettings met bevolkings van ongeveer 20,000 inwoners. Hierdie nedersettings word agri-dorpe genoem, maar anders as Mapungubwe en Groot Zimbabwe word hulle meestal in akademiese publikasies beskryf en baie min argitekte weet hoe hulle regtig gelyk het. Hierdie artikel pas 'n kwantitatiewe ontleding toe op die planne van enkele kenmerkende Tswana klipmuur wonings en nedersettings, deur fisiese eienskappe soos grootte, vorm, geometrie, ruimtelike patrone en grondgebruik-intensiteit te ondersoek. Oppervlaktes word daarna vergelyk met dié van noemswaardige grensdorpe van daardie tyd, sowel as met dié van Groot Zimbabwe wat algemeen en onbetwis as 'n stedelike entiteit aanvaar word. Die doel van die ondersoek is eenvoudig om die begrip en waardering van Tswana nedersetting teenoor Europese dorpe van daardie tyd, en teenor dié van die Shona ietwat vroeër te versterk.

**Sleutelwoorde:** Tswana, agri-dorpe, klipmuur-ruïnes, Molokwane, tweelobbige woning, *kgotla*

The popular perception of traditional African settlements remains the evenly spread dispersed homesteads of thatched rondavels and cattle enclosures that still dot the hills in some parts of the Kwazulu-Natal midlands and Eastern Cape. However, ruins of stonewalled settlements, particularly those of the Tswana in the north-western part of the country, provide evidence that large, compact villages and towns existed in pre-colonial times, specifically during what is known as the Late Iron Age (AD 1300-1840).

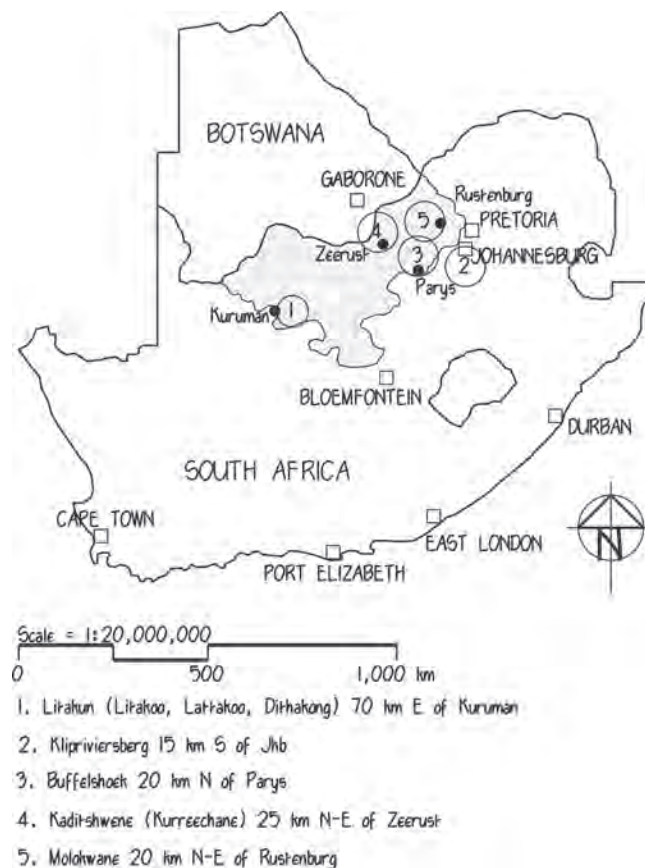
Both Mapungubwe (AD 1220 to 1300) and Great Zimbabwe (AD 1300 to 1450) were large settlements. Graham Connah (2004: 159) claims a population in the range of 3,000 to 5,000 inhabitants for Mapungubwe, and 11,000 to 18,000 inhabitants (citing Huffman) for Great Zimbabwe, prompting him to suggest that “Great Zimbabwe had a population sufficient for it to be called a town or even a city” (Connah 2001: 236). Less well known, large compact Tswana villages, called agro-towns – the focus of this article – were built in the 18<sup>th</sup> and early 19<sup>th</sup> centuries. Reverend John Campbell, who visited Kaditshwene (near Zeerust, also known as Kurreechane) in 1820, reported a population of 16,000 to 20,000, apparently more than that of Cape Town at the time. Robert Moffat similarly estimated that the town of Barolong at Pitsane had over 20,000 inhabitants.

The ancestors of the Tswana people moved, via East Africa, into the present South Africa at about AD 1300 (Huffman 2010). They were a semi-sedentary, agro-pastoral and hunting society who rapidly populated parts of present-day Gauteng, the Northwest and eastern Free State Provinces. They cultivated sorghum, beans and gourds, as well as maize. However, cattle herding was at the centre of their culture to the extent that a characteristic settlement configuration, called the Central Cattle Pattern, developed. In the 1820s, during the period of the *difaqane*, Mizilikazi effectively destroyed the established Tswana urbanism and way of life in South Africa.



**Figure 1**  
**Pre-colonial dynamics: Migration routes of the Bantu speakers vis-à-vis urban entities**  
 (drawing: the author, derived from several maps in McEvedy 1995).

Today a quarter of the Tswana live in Botswana and the rest in South Africa. According to the 2001 census, Setswana is spoken by 8.2 per cent of the population; the same percentage as English ([www.southafrica.info/about/people/population](http://www.southafrica.info/about/people/population)). Although Setswana speakers are now spread throughout South Africa, the Tswana are still the most numerous in the north-northwest of the country, an area comprising approximately 138,000 sq km or about 11 per cent (the area of the Republic of South Africa is 1,219,912 square kilometres) of South Africa, which has traditionally been the land of the Tswana. The case studies described in this article are located in this region.



**Figure 2**  
The land of the Tswana in South Africa, with Botswana added (drawing: the author).

### Sources of information

Plans of the case studies were derived from a substantial number of stonewalled settlements surveyed and recorded not only by eminent archaeologists, including Jan Boeyens (2011, 2000), Thomas Huffman (2010, 2007), Mark Anderson (2009), Julius Pistorius (1996, 1992) and Tim Maggs (1976), but also by the doyen of South African vernacular architecture, James Walton (1956). More recently, Franco Frescura (1987, 1985, 1981) described some of the settlements in architectural terms and attempted a taxonomic analysis.

During the early 19<sup>th</sup> century, Samuel Daniell (1801), William John Burchell (1812) and Samuel Watson Fenning (1840) produced vivid graphic and written accounts of Litakun near present-day Kuruman. In fact, Burchell's book entitled *Travels in the interior of southern Africa, Volume 2* (London: Longman, 1824), devoting 242 of 619 pages to Litakun, is probably the most extensive and scholarly account of Tswana customs and constructions. Litakun, however, was not a stonewalled town and the beautiful imagery cannot be compared with the evidence on the ground.

On the other hand, Kaditshwene, whose stonewall ruins were located by Jan Boeyens, was visited by John Campbell in 1820 and his depictions of the chief's compound and the interior of his hut are well known. It is puzzling and unfortunate, therefore, that other large and contemporaneous agro-towns such as Molokwane and Marothodi, both short distances from Kaditshwene, were not similarly recorded.



Architects are not trained to interpret these ruins. Site visits are nevertheless hugely informative, especially in the company of archaeologists, anthropologists and historians. With their narratives informing imagination it is possible to understand the town as it once was, to understand the scale and extent, and to relate to the ecological and physical context. Many stone walls are still intact, revealing the construction consisting of two faces of stacked stones with a rubble infill about one metre wide and varying in height between 1.5 and 2.0 metres.



**Figure 3**  
**Part of the stonewalling at Molokwane (photograph: the author).**

Research for this article relied mostly on the analysis of drawings. Selected settlement layout plans were redrawn on computer, allowing a quantitative analysis in terms of physical attributes, such as size, form, spatial organisation and land-use intensities, based on the mapping and measurement thereof.

Whenever a settlement pattern has been consistently used, the question of ideal space versus real space becomes pertinent; however, that argument is beyond the brief of this article. It rather attempts to contextualise the Tswana spatial patterns through comparative analyses with historical precedents and contemporary urban theory.

### **Case study 1 – Litakun**

As mentioned, Litakun had no stonewalling but, rather, screens and fences of reeds and wooden stakes. Interestingly, there are stone walled ruins nearby, referred to as Dithakong, but in spite of

recently substantiated Tswana linkages, the inhabitants of Litakun told 19<sup>th</sup> century visitors that they had no idea who had built them.

At Litakun, huts, like those of all the Tswana at that time, had thatched conical roofs supported by verandas over cylindrical mud walls, today colloquially referred to as rondavels. Litakun was the Batlaping capital; however, Maggs (1976: 279) notes that it was moved three times in 20 years. When Samuel Daniell visited the place in 1801, the population was estimated at between 10,000 and 15,000 inhabitants. However, William Burchell reported 5,000 inhabitants in 1812. Regrettably neither Daniell nor Burchell captured the essence of the Central Cattle Pattern in their imagery, although it is quite clear that homesteads were clustered rather than aggregated, each consisting of a number of huts surrounded by a screen. Burchell's view from the entrance into Litakun illustrates the size and spread of the town. He described it as a collection of little villages each centred on a chieftain and spread over an area roughly measuring 2.5 by 3.2 km.



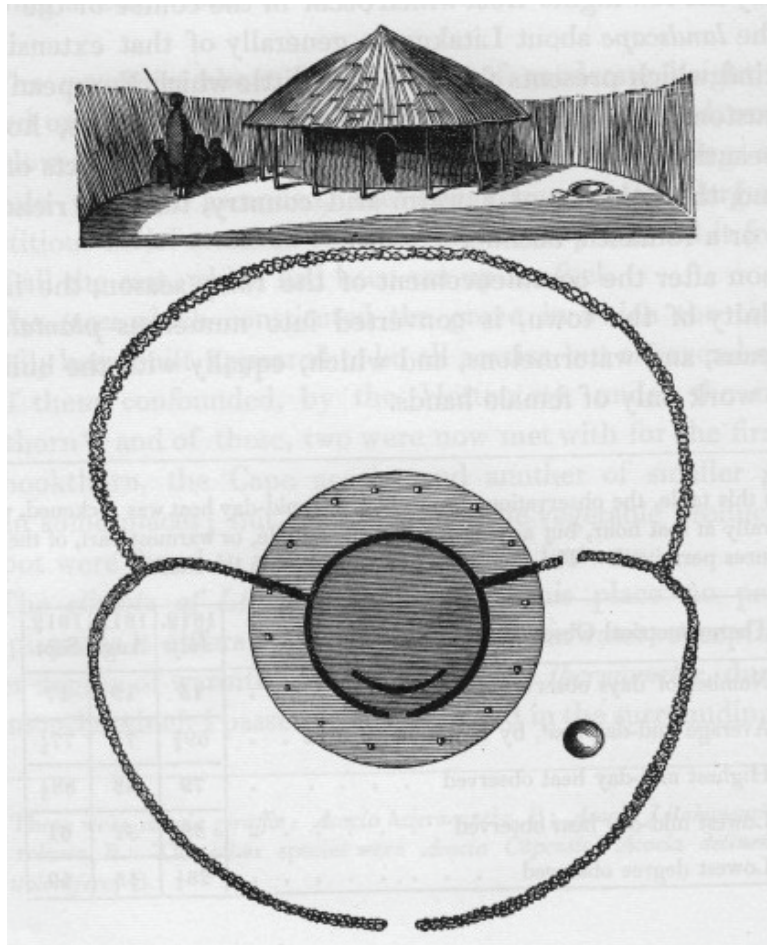
**Figure 4**  
**Entrance into Litakun by William Burchell, 1812.**



**Figure 5**  
**Homesteads by Samuel Daniell, 1801.**



Burchell is credited as being the first person to survey and record a bilobial homestead, so characteristic of Type Z settlements. Not all huts were bilobial but all had outer circular fencing defining two courtyards with two radial walls. Huts were generally 2.5 to 4.0 m across while the chief's hut had a diameter of approximately 5.0 m. The roofs of the larger houses were approximately 8.0 m in diameter and the space formed by the veranda, between the poles and the wall, provided shaded space (Walton 1956: 52-57). Burchell was also the first to note the difference between the semi-private front lobe (he called it the “public section”) and the private rear lobe. The wall inside the doorway that obstructed the view to the interior of the hut is also significant; this is not a standard configuration.



**Figure 6**  
**William Burchell's engraving of a bilobial homestead, 1812.**

Samual Watson Fenning visited Litakun in 1840-1, obviously being spared the ravages of the Difiqane (being too far southwest), and depicting him and his companions in formal conversation with the village chief. It is notable that these homesteads were closer together than those in Daniell's and Burchell's times and that the village elders were dressed in European clothes. The cattle enclosure also featured more prominently.



**Figure 7**  
**Litakun by Samuel Watson Fenning in 1840-1 (from Gordon-Brown 1975: 118).**

### **Case studies 2 and 3 – Buffelshoek and Klipriviersberg**

With no data other than the narratives, sketches and paintings of visitors, it is impossible to investigate spatial patterns or relationships in Litakun. The remains of stonewalled settlements, on the other hand, provide an inert and measurable setting for doing so, even though much of the stonewalling has collapsed. There is absolutely no evidence, however, that stonewalling was the dominant or even the preferred construction method. In areas with a scarcity of trees, the Tswana had no choice. Furthermore, even with an abundance of trees, clearing a space strewn with rocks and building walls with them, such as at Molokwane, was certainly expedient where a large number of cattle and people have to move about.

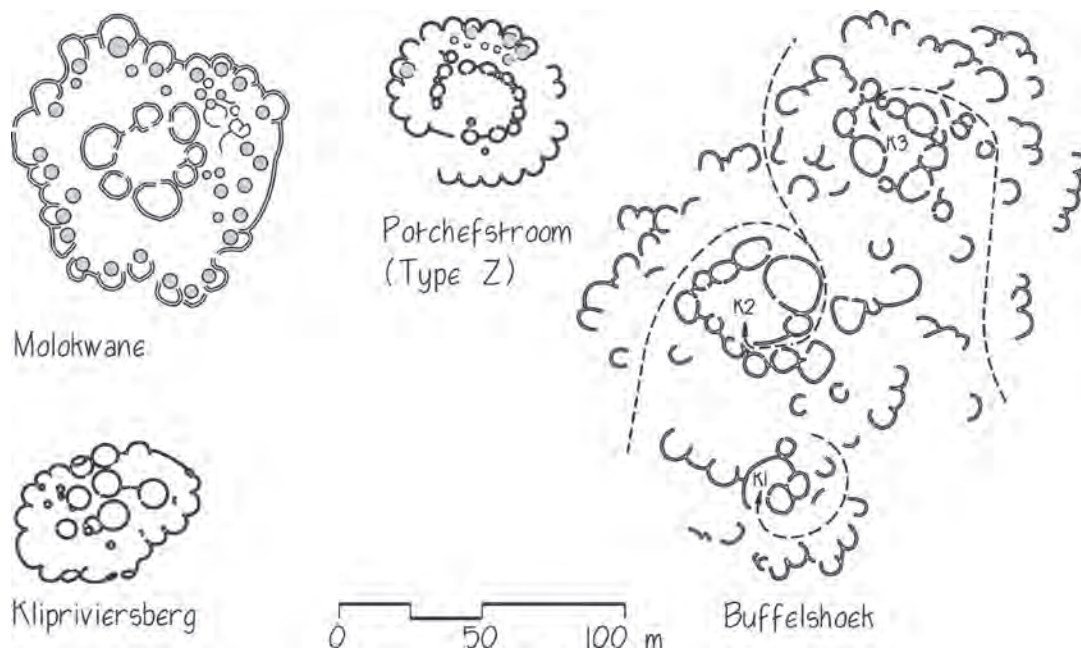
The first stonewalled settlement units – each a homestead for an extended household and its livestock – were built approximately 500 years ago in the present Free State. Viewed from above, the typical homestead resembles a fried egg (Huffman 2007: 33). Graham Connah (2004: 164) writes that settlements were composed of “as many as a hundred of such units, possibly containing up to 1,500 people” and that “these early settlements were widely spaced compared to latter ones, suggesting that the overall population was still small”. Gradually the surrounding walls were increasingly shaped in a series of scallops – forming the rear courtyards of bilobial homesteads featuring veranda huts – and by 1750 these had culminated in the distinctive Type Z and closely related Molokwane type settlement pattern, resembling a sunflower from above (Huffman 2007: 38). In spite of certain variations, Maggs (1976: 40) writes that “the bilobial pattern is generally predominant. The dwellings form a fringe around the central group”. This type of dwelling developed north of the Vaal River and is increasingly prevalent northwards.

An early version of such a settlement unit, near Potchefstroom on the road to Parys, was described by Walton (1956: 47) as consisting of “circular family units separated from each other by a distance of a hundred yards or more”. Another example is Klipriviersberg, 15 km south of Johannesburg. Fortunately the whole site has been surveyed and described (Huffman

2007: 38) as a large pastoral Tswana community of some 19 settlements, dating from about the year 1500. The linear form of the village is distinctive; it is not clear whether the layout simply followed the contours of the koppies on which it was built or whether the homesteads enfronted a spiralling cattle path as at Buffelshoek, as depicted below. Walton (1956: 47) observes that “each homestead has an approximately circular scalloped outer wall with a single entrance”. Adjacent homesteads were now only 10 metres, or even less, from one another. This Tswana community was, like many others, destroyed by Mzilikazi.

Another informative example is that of Buffelshoek situated 20 km north of Parys. Deriving his information from a Master’s thesis by Michael Taylor at Wits in 1979, Frescura (1981: 146-151) recounts that Buffelshoek was constructed by the Tswana about 1750, but was destroyed and deserted around 1822. Since it consisted of three adjacent settlement units, Frescura thought that it must have been occupied by more than 120 people and that “the immediate region must have supported between 3,000 to 4,000 people”. He suggests that the spiralling cattle paths allowed residents to check on their property as they were brought in for the night. His own interpretation is that K1 was built first, followed by K3 as the household grew while also accumulating more cattle, and finally by K2 which was never finished. Frescura, nevertheless, cautiously notes that “the extent to which the three settlements coexisted is not known”.

Finally, the illustration includes a plan of a settlement unit at Molokwane, the final case study considered here, as a comparison, portraying the Type Z walling in its final form. Molokwane will be discussed further on, but it should be noted that the unit is about the same size as K2 and K3 at Buffelshoek, and considerably larger than those recorded at Potchefstroom and Klipriviersberg. It could be that later homesteads accommodated not only one extended family, but became an extended household with unrelated families who were most probably followers of the headman.



**Figure 8**  
**Tswana homestead patterns (drawing: the author. Molokwane after Huffman 2007: 40; Potchefstroom and Klipriviersberg after Walton 1956: 48, 49; Buffelshoek after Frescura 1981: 149).**

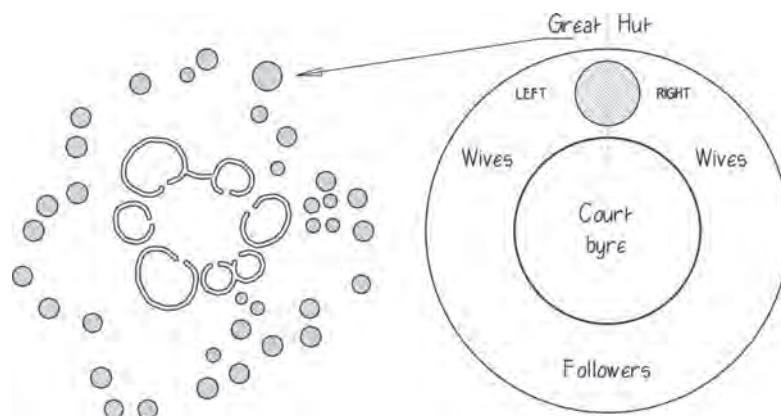




**Figure 9**  
**Klipriviersberg village (drawing: the author after Walton 1956: 49).**

### Historical perspective

The first stonewalled settlements were built by the Bafokeng (who later migrated north and are still living near Rustenburg) in the Free State between the 15<sup>th</sup> and 17<sup>th</sup> centuries (Huffman 2007: 33). These were early manifestations of the Central Cattle Pattern, which evolved relatively rapidly into what archaeologists call the Type Z pattern and its derivatives. These were built mainly in the 18<sup>th</sup> century and survived into the first half of the 19<sup>th</sup> century. Type Z typically consisted of a core surrounded by an intervening space and, at the edge “a loose circle of bilobial households” (Huffman 2007: 41). Whereas the central complex was the exclusive domain of men, the ring of huts and their courtyards (called *lolwapa*; single: *lapa* or *lelapa*) were the domain of married women. The dwelling, this ensemble of huts and courtyards, is also referred to as *malapa*. This pattern was extremely consistent throughout this period, although examples are found 500 km apart.



**Figure 10**  
**The Central Cattle Pattern (drawing: the author after Huffman 2007: 25, 29).**

When setting out a settlement, the position and orientation of the chief's dwelling, his courtyard and the core containing the *kgotla* (plural: *makgotla*) and cattle-pens are first determined. The compounds of the wives are then located to the left and right of the chief, facing the core, followed by those of relatives and finally those of the followers on the opposite side (Maggs 1976: 277). The resulting shape is roughly circular or oval.

The homestead of an extended household, the settlement unit, is called a *kgoro* in Setswana, which is clustered to form a settlement or ward, called *dikgoro*. Maggs (1976: 277) asserts that wards were "relatively self-sufficient and probably more cohesive than the town as a whole". He adds that "if a settlement should split up, as was frequently the case in the earlier nineteenth century, the cleavage would tend to pass between wards, rather than through them".

Wards can be independent villages (hamlets would be more appropriate), but later on were usually clustered to form a village, *motse* (plural: *metse*) (Pistorius 1992: 1). The agro-towns are also *metse*, but they consist of several villages each. Their stone-walled ruins are called mega sites by archaeologists.

The *kgotla* is unquestionably the most important place at every settlement level, and the head or chief of a homestead, a ward or a village, had a *kgotla* where he presided when disputes had to be litigated, or decisions affecting the welfare of his people had to be taken. The level of authority was also aligned with the urban scale, with the heads of the homesteads settling family disputes, and the chief meting out judgement for severe transgressions.

#### **Case study 4 – Kaditshwene (Kurreechane)**

Although well documented and reasonably illustrated, until recently, archaeologists could not agree on the location of Kaditshwene. Jan Boeyens (2000) claims to have determined the exact location based partly on an analysis of the geography depicted in Campbell's sketches and watercolour of the town, clearly depicting the settlement on a high hill. In the early 19<sup>th</sup> century, Kaditshwene was a capital of the Bahurutshe. The dispute over its locality erupted not only because the Bahurutshe built numerous stone-walled complexes in the area, but also because, around 1830 or so, Nguni-ised Tswana communities, as well as Mzilikazi himself, built stonewalled settlements in the vicinity of present-day Zeerust, but not in the Tswana type Z pattern. A significant aspect of Kaditshwene is that, unlike the other communities discussed in this article, the inhabitants mined, melted and worked iron, trading the products (hoe blades and spear points) with other communities.

Like Fenning, 20 years later at Litakun, John Campbell showed Kaditshwene as comprising homesteads consisting of several fenced-off huts clustered in relatively close proximity. From the aerial photograph of the ruins it is now possible to distinguish the distinct geometry of the Type Z pattern, the scalloped fringe of each homestead and the core complex in the centre.

A significant contribution by Campbell was his illustration of Chief Senosi's homestead and the interior of his personal hut. Whereas Tswana huts usually had a diameter of no more than four metres, his was at least 10 metres across – spanning too far for the usual construction methods and requiring an intermediate ring of timber poles to support the roof structure. The interior plastering, colours and graphic motifs are also revealing.



**Figure 11**  
**Kaditshwene by John Campbell in 1820**  
**(from Anderson 2009: 13).**



**Figure 12**  
**Veranda houses at Kurreechane in the Marico Valley as depicted by John Campbell, 1820**  
**(from [www.kaditshwene.com](http://www.kaditshwene.com)).**



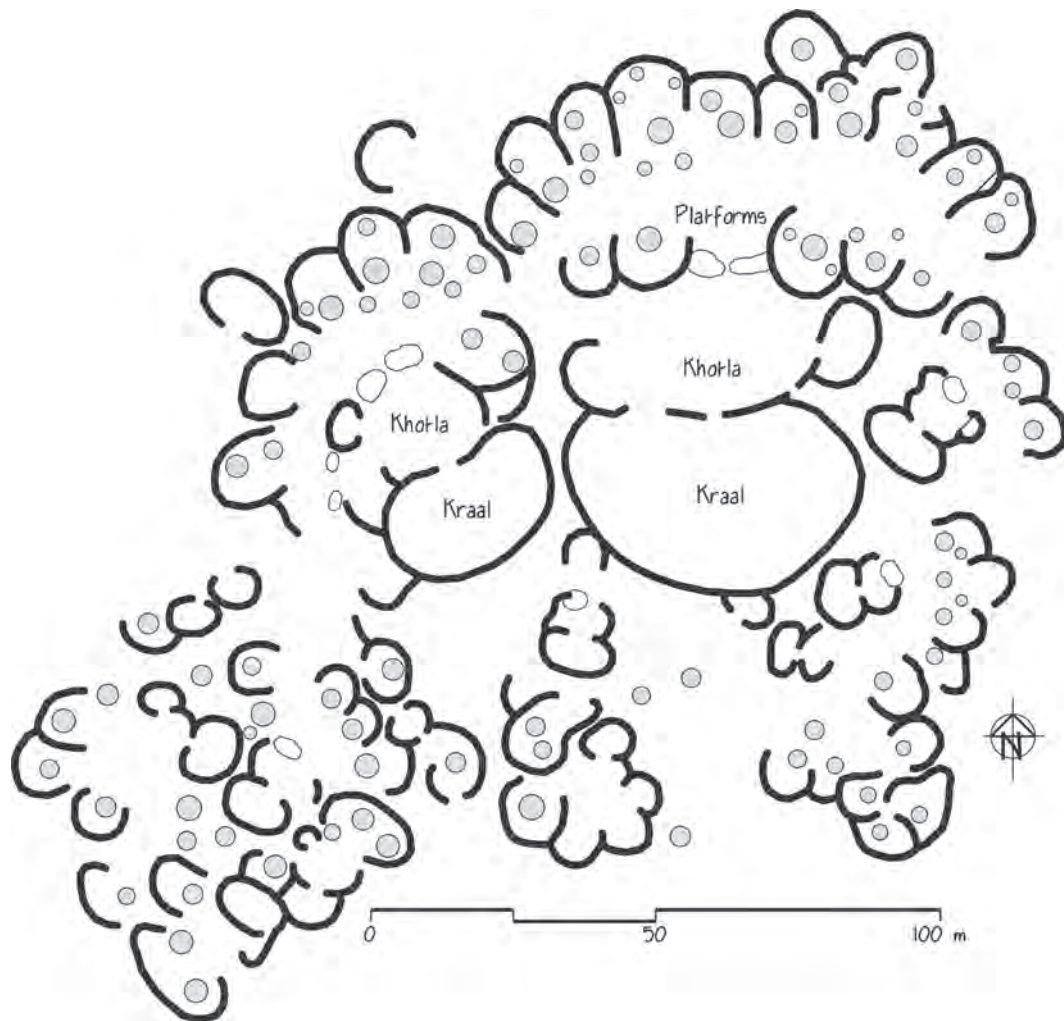


**Figure 13**  
Interior of Chief Senosi's house, documented by John Campbell in 1820  
(from [www.kaditshwene.com](http://www.kaditshwene.com)).

Boeyens himself (2000) suggests that Kaditshwene constitutes the interface between historical depictions and descriptions, oral history and archeological surveys, obviously making it an ideal case study for comprehensive analysis. There are, however, a number of problems. Firstly, a site plan of all the ruins comprising the town does not seem to exist. Secondly, Campbell's painting of Chief Senosi's compound shows a solitary, tranquil rural homestead with a round footprint, and unquestionably not the dense, scalloped pattern on the aerial photograph and the surveyed site plan. The historical observations and the current evidence simply do not match. Thirdly, because Kaditshwene was an iron-manufacturing town, its layout, the central core in particular, may have become distorted and is not a representative example.



**Figure 14**  
Portion of the Kaditshwene ruins from the air  
(from [www.kaditshwene.com](http://www.kaditshwene.com)).



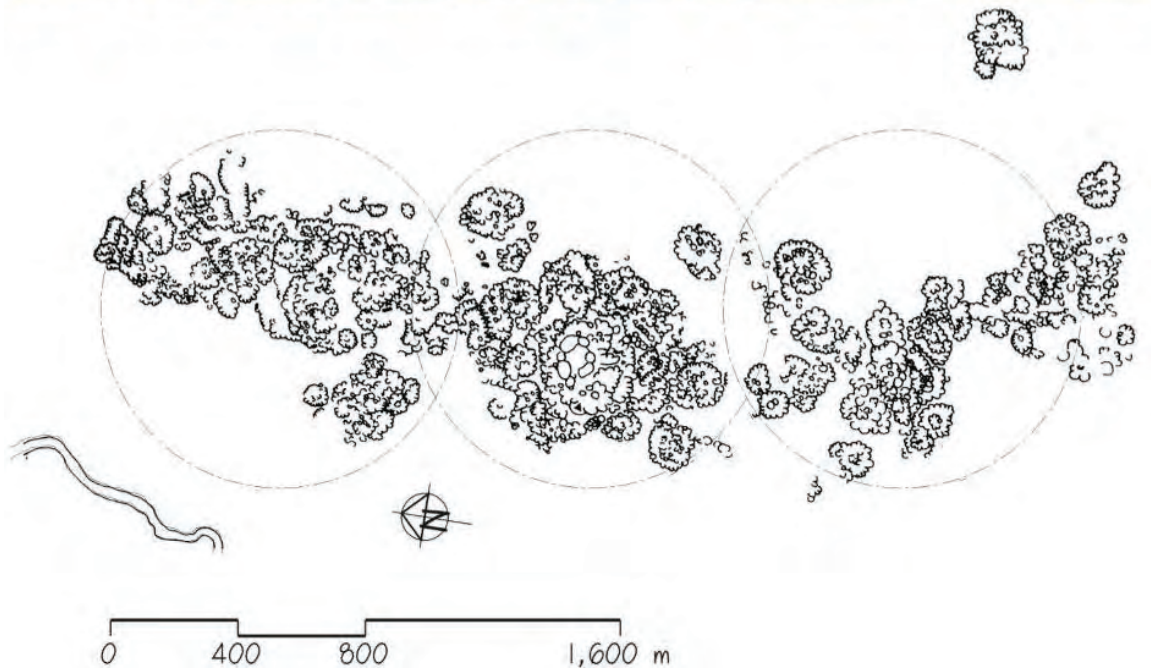
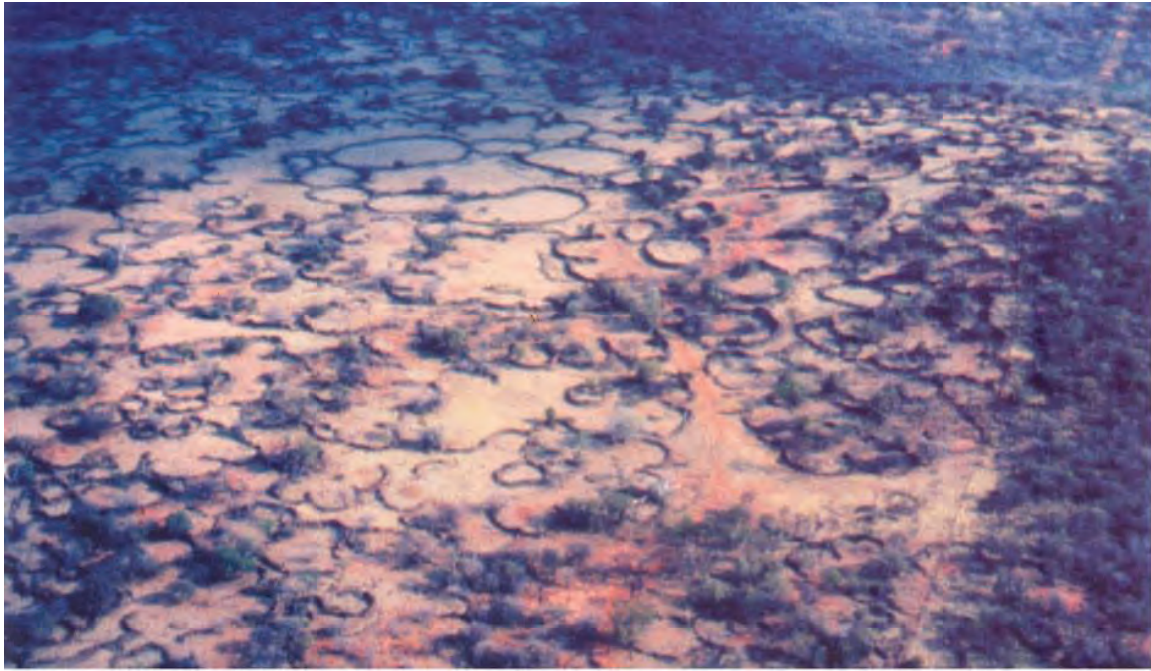
**Figure 15**  
**The main ward in Kaditshwene as surveyed by Jan Boeyens**  
**(drawing: the author after Boeyens and Plug 2011: 4).**

### **Case study 5 – Molokwane**

Kaditshwene is one of four stone-walled Tswana agro-towns in the Magaliesberg-Pilanesberg-Marico Valley region. The others are the Tlokwa settlement of Marothodi directly west of Pilanesberg, Boitsemagano, approximately 40 km south-east from Marothodi, and Molokwane, located only nine km south of Boitsemagano and approximately 25 km west of present-day Rustenburg. The latter two were built by related Bakwena Bamodimosana communities.

They are all located in a strip of mixed bushveld (featuring a variety of Acacia tree species), with a mean summer rainfall of between 400 and 600 mm and a temperate climate with temperatures in a range of 18° to 26°C (Anderson 2009: 47, 53). Molokwane, the subject of the analysis that follows below, is situated approximately 90 km south-west of Kaditshwene.





**Figure 16**  
**Molokwane (plan derived from Pistorius 1992: 5;**  
**aerial photograph from Huffman 2007: 42).**

It was chosen for analysis because it is the only site where the plan of the site was still available in its totality, it was the largest and most compact of the stone-walled agro-towns, and Julius Pistorius (1992, 1996) had surveyed and described both one of the smallest (SEL 1) as well as the largest (SEL 2) settlement units in considerable detail. Since the site is not overgrown and – nearly 200 years after its demise – grass inside the perimeter is still of a different species from that outside, showing up in a lighter shade of green on satellite imagery, the edges and even the stonewalls inside are still clearly identifiable, allowing scale and size to be checked against the data found in literature.





**Figure 17**  
**Satellite image of the Molokwane ruins**  
**(from Google Earth).**

The site was apparently first occupied around AD 1650 and built up by the Bakwena over the next 170 years, until it was abandoned in 1820 (Pistorius 1992: 57). Pistorius estimated the population to be around 10,000-12,000 in the early 19<sup>th</sup> century, and today, it is probably the largest stone-walled archaeological site in South Africa, covering an area of approximately 4-5 km<sup>2</sup>, measuring 3.0 km from north to south and 1.5 km from east to west (Pistorius 1992: 17).

Unlike the frontier towns of the period that were first laid out and then filled in, most vernacular settlements, such as those of the Tswana, were organic, and grew incrementally by addition. The edges expanded as the towns grew. For that reason it is meaningful to commence analysis with the smallest building block.

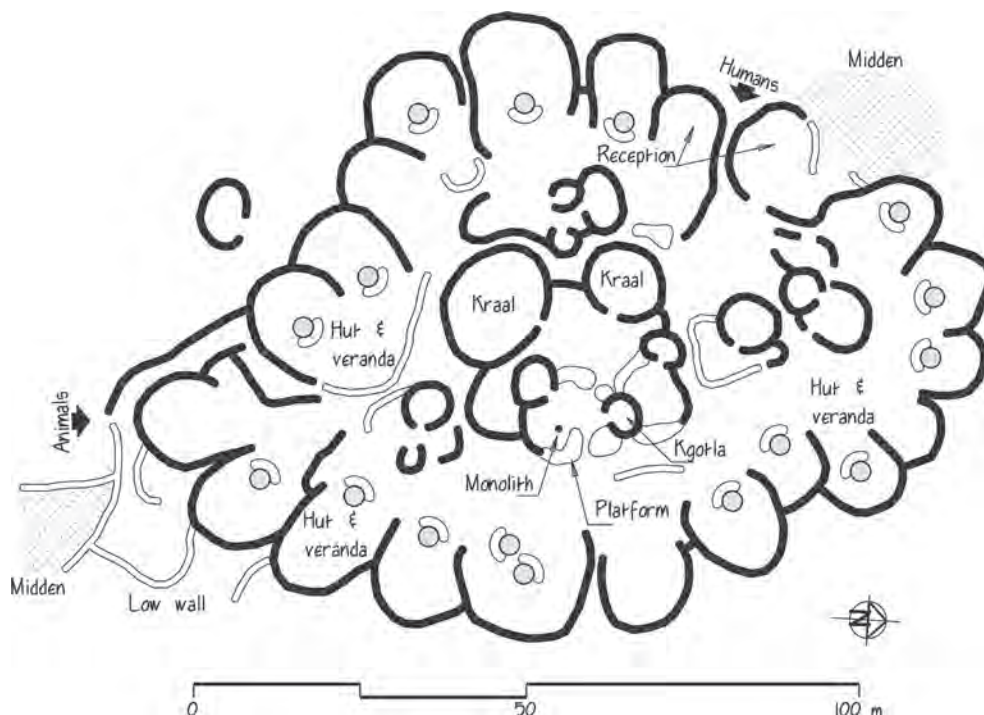
SEL 1 is located on the south-western edge of the southernmost village. Described as “a commoner Kwena *kgoro*” (homestead), Pistorius’ survey of SEL 1 is particularly helpful since he also located the huts (according to their stone-paved floors). His descriptions (1992:60-69) of the constituent elements are concise and authoritative. Interestingly it had only one quite inconspicuous entrance for humans, flanked by what could have been reception areas for visitors. A separate entrance for animals (cattle, calves, sheep and/or goats) led via a stone-walled lane across the intervening space surrounding the central kraal complex into their stockades. The spatial relationships between the cattle kraal, the *kgotla* and the *malapa* of the chief represent, as Pistorius (1992: 62) notes, “the fundamental spatial characteristics of the *kgoro*”. Other male activities in the inner kraal complex include milking, slaughtering (also ritual), leatherworking, repairing tools and weapons, and informal meetings. Headmen and chiefs were buried beneath the cattle-pens.

The *kgotla* was the primary, formal forum where judicial, political and administrative affairs were debated. It was patently not a public space where only a few men – elders and

selected advisors – were allowed to enter through the small, low entrance. The walls were the highest, at 2.0 m, in the settlement, indicating a desire for secrecy or at least privacy and seclusion. In front of the *kgotla* is a secondary gathering space partly defined by platforms and a large stone monolith. The said area was the setting for judicial and ritual events that could be attended by a larger audience, with the platforms possibly serving to allow more spectators to view the proceedings.

Pistorius identified 16 huts. The scalloped walls obviously formed the rear of the *malapa*, while the fronts of the *malapa* were probably demarcated by reeds or wooden fencing. He did not attempt a reconstruction, but simply asserted that the “general features” of the excavated huts are similar to those illustrated by Burchell and Campbell, and noted specifically that “Charles Bell’s illustration of early Batswana huts near the Magaliesberg and Molokwane, probably shows what the huts of SEL 1 looked like”. As noted, this outer fringe of dwellings was reserved for female activities, which will be described in more detail in the discussion of the typology of bilobial dwellings. Note that the huts of the headman (*kgosana*) and his headwife are contained within the same scallop on the eastern side.

The plan below is of course misleading since, while this *kgoro* is located on the western fringe of the village, it is not isolated with only 10.0 m separating it from the *dikgoro* to the west. The spaces between the *dikgoro* form an intrinsic part of an elaborate system of circulation consisting of narrow footpaths for people and somewhat wider lanes for animals. Starting with the intervening spatial ring between the *malapa* and the inner complex, which not only served as a buffer between the male and female territories, but was also exclusively used for the circulation of people and stock. Not only was there, as Maggs (1976: 282) describes, a network of footpaths between the various *dikgoro*, but also, the paths would radiate outwards from the *motse* to places to where the women worked the fields and fetched water and wood, as well as to cattle posts and neighbouring villages.

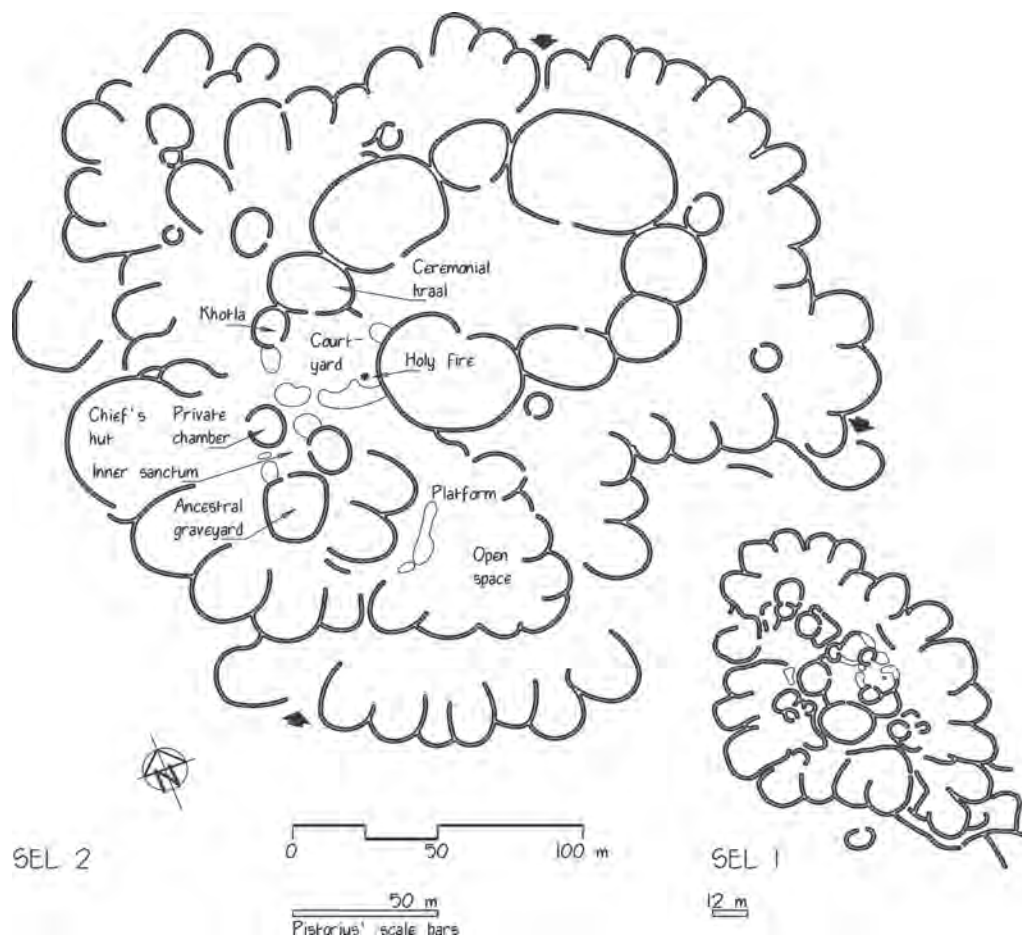


**Figure 18**  
**A settlement unit known as SEL 1 at Molokwane**  
**(drawing: the author after Pistorius 1992: 18).**

Like SEL 1 above, SEL 2, the homestead of the chief, called a *kgosing* (*kgosi* means chief in Setswana), very clearly retains the general layout pattern of the settlement unit with an inner kraal complex, the interstitial space and the scalloped fringe. There are, however, a number of significant differences.

The first difference is that SEL2 was built according to a substantially larger scale, prompting Pistorius (1996: 145) to call it a “super *kgoro*”. While SEL 1 has a footprint of 0.8 ha, SEL 2 measures 5.3 ha. Whereas the *kgotla* in SEL 1 is 15 m<sup>2</sup> and cannot conceivably accommodate more than eight people, the *khosi’s kgotla* was 113 m<sup>2</sup> and could comfortably accommodate up to 60 people. The space inside the scallop occupied by the headman in SEL 1 has an area of 226 m<sup>2</sup>, while the *kgosi’s* dwelling is situated in a 1,700 m<sup>2</sup> scallop. Secondly, SEL2 contains more specialised spaces. Apart from the usual *kgotla* and its associated courtyard, the chief also has a private chamber and an inner sanctum. The ancestral graveyard is currently a dedicated place. Thirdly, there are three entrances; although, it is not clear from Pistorius’ annotated plan which of these are used for humans and which for animals. Interestingly the *kgosi’s* rear *lapa* has its own discreet entrance.

There can be no clearer evidence of socio-economic stratification and the manifestation of the unequal distribution of power and wealth than this comparison. The *kgosi* simply possessed substantially more of everything – cattle, wives and children, close family, followers, even space in terms of floor area and the number of dedicated facilities.



**Figure 19**  
**SEL 2, the *kgosing* at Molokwane, compared to SEL 1**  
 (drawing of SEL 2 by Philip Lourens for the author after Pistorius 1996: 146).

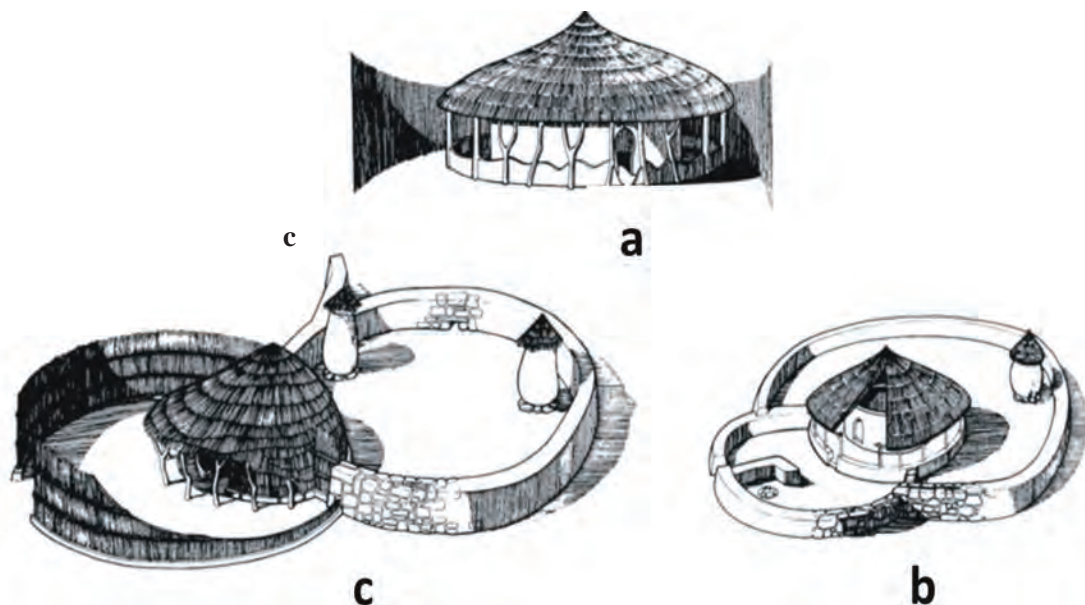


## The bilobial house – courtyards and verandas

Whereas the central core with its *kgotla* and cattle-pens is shared with the Sotho, the distinguishing feature of the Tswana homestead is the fringe of bilobial dwellings whose rear *malapa* are formed by the distinctive scalloped stone wall forming the outer edge. Frescura (1981: 26) recognises that the Tswana bilobial dwelling sets out to outline a territorial statement. He adds (1981: 154) that “the construction and planning of the Iron Age bilobial dwelling shows a very high degree of sophistication despite the limitations imposed by materials and technology”.

The bilobial dwelling is not a family dwelling but the territory of a wife. The front courtyard is a semi-public outdoor space used for cooking, eating and socialising, while the rear courtyard is used for storage, fowl roosts and what Maggs (1976: 281) calls “rough housework”. The hut itself is used for sleeping and cooking (in inclement weather), while the veranda provides shade during the day.

Frescura’s drawings are particularly helpful. Dwelling (a) was originally sketched by Burchell at Dithakong in 1815. Dwelling (b) was redrawn after a reconstruction by Maggs during excavations at Doornberg (Maphororong) near Kroonstad. Dwelling (c) is derived from a reconstruction by Taylor who surveyed Late Iron Age settlements on the northern edge of the Vredefort Dome near Vereeniging. It is estimated that the latter two date from ca. 1750.



**Figure 20**  
**Bilobial homesteads**  
(from Frescura 1981: 156).

## Composition of Molokwane

Pistorius (1992: 59) suggests that “the ground plan and layout of the *motse* is not based on geometric considerations but on a conceptual model considering mainly symbols of status, rank and rules of precedence”. Even when a village resettles in another locality, the orientation, relationships and relative positions between the various elements are retained. He points out (1992: 59) that Tswana towns were customarily located along rivers and was the reason the

layout of three linear divisions developed, with the *kgosi* occupying the central division, while the adjacent divisions are called “upper side” and “lower side” respectively, or more precisely, “upstream” or “downstream”.

It is generally assumed that vernacular settlements grow organically and incrementally in an unplanned manner. However, from the above it is clear that just as the layout of individual units conformed to a conceptual model, so the spatial organisation of the settlement with its ordered three zones did not evolve haphazardly, but must have been the result of an uniform vision and standardised, sequential process of unfolding space and composing the *motse*.

Vernacular urbanism and architecture are firmly rooted in the idea that solutions developed over a long time – typologies tend to evolve until they find their most rational, logical and simple form for a given situation and context. Amos Rapoport considers the vernacular tradition, in general, to be the “direct and unselfconscious translation into physical form of a culture, its needs and values” (1969:1-2). He argues that socio-cultural factors determine the form of vernacular buildings, and that climate, materials, construction and technology are modifying factors. Toyin Huntar (1981: 36), the eminent Nigerian architect and scholar, argues persuasively in his book entitled *Traditional African environments: The science, the history, the thought processes*, that culture, as the embodiment of a way of life, organises both social behaviour and space, made manifest as physical territory.

The Tswana urban model, therefore, was shaped not only by “status, rank and rules of precedence”, but by a range of factors, internal as well as external, including strict farming practices, precise demarcation of gender roles, and conventions of social interaction. The function of the *kgotla* and the coherence of the ward constitute two additional factors. Three criteria were considered to put Tswana urbanism into perspective: size, population and spatial organisation.

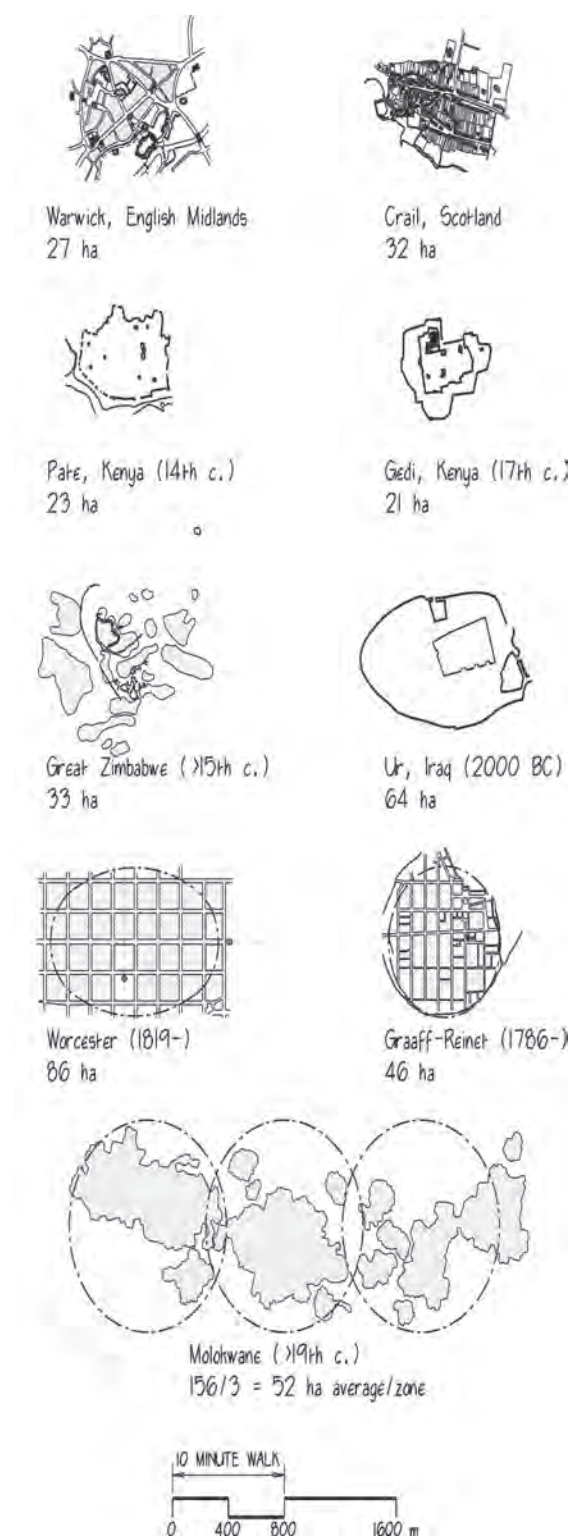
## Size

Maggs (1976: 318) states that the Tswana “live in much larger and more compact settlements, usually of several thousand inhabitants, whereas the Sotho tend to live in small, loosely arranged villages of a few dozen to a hundred or so people”. The Sotho settlement pattern conformed to the predominant indigenous pre-colonial settlement landscape of sub-Saharan Africa, that of dispersed rural villages – a homogeneous pattern of homesteads consisting of mud and thatched huts around outdoor living spaces. This was how the people lived for millennia. Their guardian institutions were so successful that an outstanding and admirable achievement of African village society was that social harmony prevailed without centralised authority (Davidson 1967: 169).

Why did the village morphology undergo a transition from widely spaced homesteads, to an arrangement where homesteads are much closer to one another as at Klipriviersberg, to the large, dense, aggregated urban artefact of Molokwane? Initially, this transition occurred certainly because of pressure on good grazing land, arable soil and water supplies, and probably as protection against cattle raids from neighbouring communities, but later – actually as early as 1780 according to Huffman (2010) – unquestionably, as a defensive measure against attacks during the *difaqane*. All of these could have culminated in the emergence of ideological control by strong chieftainships, as described by Pistorius (1996: 161).

Huffman (2007: 17) declares succinctly: “Size in particular involves politics”. The comparison below is revealing in two aspects – they are all inhabited by communities with

centralised judicial and administrative control, and they all fit into an ellipse of 1,200-800 m, but more often in a circle with a diameter of 800 m. The inevitable question is: In what way are these phenomena significant or relevant?

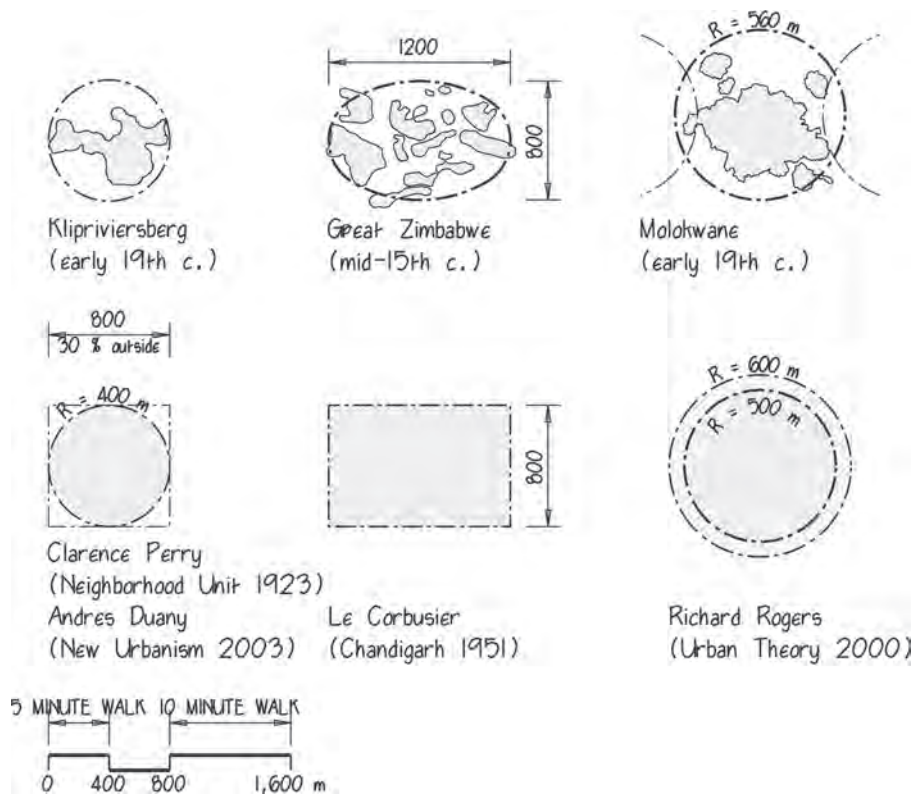


**Figure 21**  
**Molokwane compared**  
**(drawing: the author).**



Those dimensions seem to have been widely applied as urban templates in pre-industrial times. Ur in present-day Iraq, one of the first cities, fits the ellipse. The Greek and Roman colonial towns of Priene and Timgad, dating from the 4<sup>th</sup> c. BC and AD 1<sup>st</sup> c. respectively, both loosely fit into a circle of 800 metres across. Current urban theory would classify that as a comfortable five minute walk (400 m) from centre to edge. Cliff Moughtin (*Urban design: Street and square*, 2003) writes that “an urban form, such as a medieval town, usually has a maximum total dimension of 800 m can be seen as a whole from a critical distance of 1,5 km and therefore still retains a human scale”. Even Le Corbusier (*The city of tomorrow and its planning*, 1929) explained that the medieval cities so admired by Camillo Sitte are rarely more than 800 m across.

Whereas Moughtin’s precepts of association and cognitive legibility may be relevant, it is of course quite inconceivable that those dimensions were adopted to achieve walkability – villagers had to walk extraordinarily long distances daily to herd cattle, work fields and fetch water. The sizes were more likely determined by thresholds imposed by communications and socio-economic considerations, a field of study in which Ronald Fletcher (2002, 2009) specialises. In the early 20<sup>th</sup> century, however, those dimensions emerged again as part of urban planning theory, and have intermittently remained so ever since. In fact, although it might be totally irrelevant, it was irresistible to compare the urban entities discussed in the article with contemporary concepts of size.



**Figure 22**  
**Comparison of neighbourhoods**  
**(drawing: the author).**

## Population

Pistorius clearly derived his 4-5 km<sup>2</sup> area for Molokwane by simply multiplying 3.0 km (north to south) by 1.5 km (east to west). A more exact measuring of the space enclosed by stonewalling, the footprint, gives an area of 156 ha. SEL 1 comprised 16 huts and a footprint of 0.8 ha. Huffman's example consisted of 24 huts on a footprint of 0.7 ha. If the average of the number of huts per hectare is extrapolated, Molokwane as a whole – measured as 156 ha – yields an extrapolated total of 4,260 huts.

Calculations of a population size will always be speculative and tenuous. Alex Willcox (1988: 116) used an occupancy ratio of five persons per dwelling to calculate the population of Litakun. Maggs (1976: 266) assumes a more reasonable three people per hut. Using Maggs' norm, Molokwane must have had a population of 12,780, a figure that aligns comfortably with Pistorius' estimate of 10,000-12,000 people. Since Molekwane is by far the largest site, these rough calculations cast doubt on the claims repeated in numerous publications that Tswana agro-towns had populations exceeding 20,000, larger than Cape Town. Cape Town had a population of about 12,000 in 1754 that had increased to 20,000 in 1840. Assuming constant growth, that would mean a population of approximately 16,000 by 1800, the decade in which the Tswana towns were first reported on. In addition, Cape Town occupied approximately 265 ha in 1826, one-and-a-half times the footprint of Molokwane four years earlier.

The persistent claims of a population of 20,000 are, therefore, extremely unconvincing and a statement of “approximately 10,000 or slightly more” is arguably more realistic. The claim that Tswana agro-towns had more inhabitants than Cape Town had at that time cannot be substantiated and is equally unjustifiable.

Referring back to Figure 21, it should be noted that medieval cities usually also had populations in the 8,000-12,000 range (Geis 1981). In fact, the eminent urbanist, Léon Krier (1998: 128) based his *Les Quartiers* (urban quarter), or city within a city philosophy, on the pattern of historic European urban cores, propagating urban quarters of around 30-40 ha for a population not exceeding 10,000. The figure 10,000 appears regularly in literature on urban history. For example, Lamu, the quintessential, compact Swahili town had approximately 10,000 inhabitants in the 19<sup>th</sup> century. Furthermore, not only are Christopher Alexander and his collaborators adamant that 5,000 to 10,000 inhabitants occupying about 30 ha are the proper range for a community (1977: 71-74), but the *Rural poverty report 2001* released by the International Fund for Agricultural Development (IFAD) found that a rural community commonly consists of approximately 5,000 to 10,000 people.

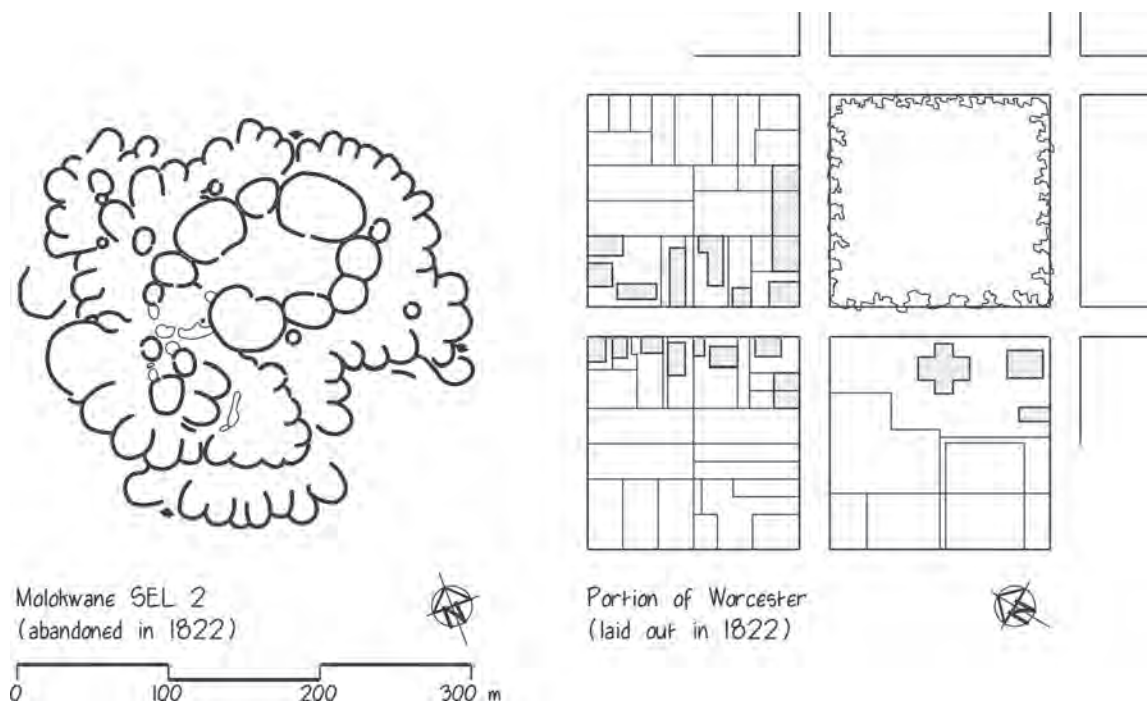
## Spatial organisation

The organic shape of SEL 2, the *kgosing* of Molokwane is obviously geometrically the exact opposite to Worcester's uncompromised grid, suggesting that they cannot be meaningfully compared. Both, however, share a codified plan layout, with conventions for circulation routes and the relationships of dwellings with them, as well as for the relative location of sacred, judicial and administrative institutions, and the allocation and demarcation of property.

The domed hut of the Neolithic Middle East gradually gave way to the square and rectangular room, which became the norm everywhere except in most of sub-Saharan Africa. In fact, Rapoport (1969: 25, 77) points out that the choice of circular forms may be symbolic, adding that some indigenous African languages do not have a word for “straight”. The fact

remains that delineating spaces as round forms could have been either the result of a fundamental metaphysically-inspired choice, or simply the most pragmatic and appropriate geometry for conditions at that time.

Rounded spaces are intrinsically fractal at all scales and are not affected by the constraints and limitations imposed by Cartesian geometries. They offer nearly unlimited flexibility to respond to different social structures (monogamous households are more compact than polygamous ones), economic activities (spatial relationships to crops, granaries, cattle kraals and livestock pens) and external threats such as predatory animals and human raiders (the integration of protective fencing and enclosures). Not only homesteads and wards, but also the villages and clusters of villages, can be contracted, expanded and clustered to form a range of urban typologies – molecular (Potchefstroom and Buffelshoek), linear (Klipriviersberg) or carpet (each zone at Molokwane), and then assembled again (the whole of Molokwane *motse*).



**Figure 23**  
**Molokwane SEL 2 and a fragment of Worcester compared**  
**(drawing: the author).**

## Conclusion

Even a superficial scrutiny of Molokwane and the precedents confirm that Tswana spatial patterns were codified and responded to immutable farming and social practices, as well as ways of inhabiting territory on all scales that dictated geometry, spatial relationships and distribution of functions and families. In other words: There was an economic, social and ecological logic applied to the patterns. Not only are the hierarchy of spaces from public to semi-public to semi-private and private areas and the system of paths that connect them apparently particularly enduring, but also, the relative locality of elements, whether an entrance gateway, a cattle kraal, the chief's hut, the *kgotla*, the ceremonial courtyard, individual dwellings or the women's cooking areas. The hierarchy of space regulates not only movement, but also the relationship between the constituent components in the settlement. The resulting spatiality also impacts on how members



of the community and even members of a household interact. Finally, although the geometry is organic, the spatial patterns did not allow agro-towns to develop uncontrolled, and in terms of size, population and spatial organisation, they largely conformed to pre-industrial urban entities.

The scale and spatial complexity of these patterns offer important insight into traditional Tswana settlement concepts before European interference. In addition, the value of these patterns is that they challenge (and should encourage) architects and planners to reassess the social and historical appropriateness of the predominantly Eurocentric building and urban typologies currently entrenched in policies and practice.

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