

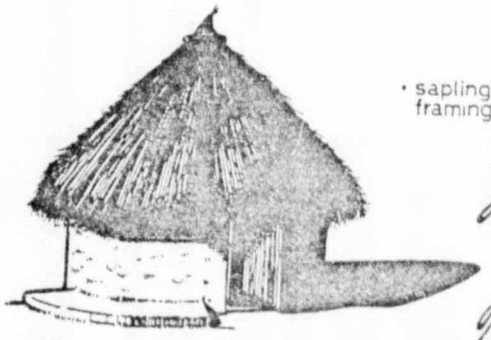
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The development of rural vernacular architecture in Southern Africa

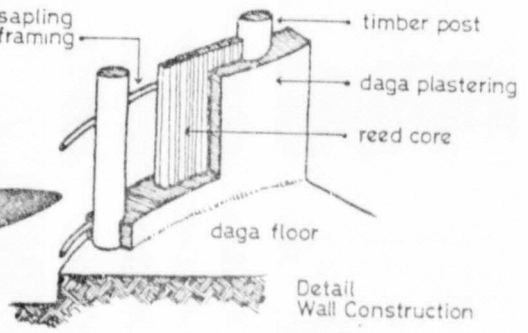
Frescura, Franco

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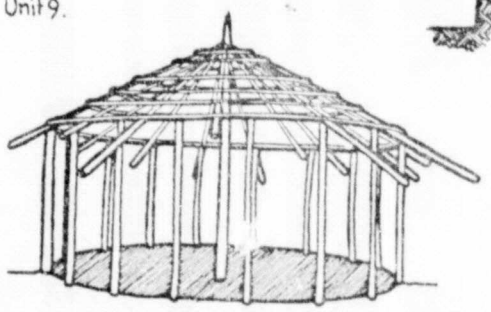
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Unit 9.



Detail
Wall Construction



Detail : Cone on Cylinder
Framework with Centrepost
Shangaan : Bushbuckridge

Cone-on-Cylinder: Unit 9.

UNIT 9.

- CLASSIFICATION : CONE ON CYLINDER.
- LOCATION : KAAPMUIDEN, KANGWANE.
- CONSTRUCTION : TIMBER POSTS ARE SET INTO THE GROUND AT INTERVALS OF APPROX 1,000 m A REED SCREEN LAID VERTICALLY IS SANDWICHED BETWEEN SAPLINGS LAID AT THE TOP & BOTTOM OF THE PANEL & PROTRUDING ON EITHER SIDE. THE WHOLE IS THEN FASTENED TO THE TIMBER COLUMNS & AN EARTH PACKING & DAGA PLASTER IS APPLIED ON EITHER SIDE. ROOF BEAMS CARRIED BY THE TIMBER POSTS ARE BROUGHT RADIALLY TO A CENTRAL CROWN WHERE THEY ARE SUPPORTED BY A CENTRAL POST CARRIED TO THE GROUND. THATCH COVER LAID SEED END DOWN.
- SOCIAL GROUPING : HOMESTEAD IS CLUSTERED LOOSELY ABOUT A CENTRAL SPACE FOCUSING UPON A LARGE THORN TREE. REED FENCING IS USED TO ISOLATE AREAS OF PRIVACY OR TO CREATE TERRITORIAL IMPERATIVES. UNIT 9 FUNCTIONED AS A LIVING/SLEEPING SPACE. A LOW PACKED EARTH SEAT WAS SITED BY THE DOORWAY.
- GENERAL : HOMESTEAD OF MIXED DWELLING CLASSIFICATION. NO WINDOWS OR SMOKE FLUES. CONDITION OF UNIT - AVERAGE ; CONDITION OF UNIT IN RELATION TO HOMESTEAD - GOOD

kicks would open the rear of the dwelling and the residents could then make good their escape. The second point relates to the Eiland reconstruction of the dwelling of the head wife which features a ceiling consisting of a bound grass rope secured to the inside of the roof structure beginning at the apex and spiralling down to the wall perimeter. Neither of these features has been recorded during the course of current research and although in the case of the second doorway this has been difficult to assess through its very nature, the usage of both appears to have fallen by the wayside.

KaNgwane

Although Swazi cone on cylinder forms are generally similar, three different constructional approaches to the drum wall were recorded. In the first timber posts were set closely together along the drum perimeter supporting the conical roof frame which was then thatched over, the grass bundles being laid seed end down. The apex was finished off with a thatch "skirt" wound about the crown, as described in the Thonga example. The timber wall was packed with earth and plastered over with daga on both sides, although in some examples this was done internally only, the timber structure being expressed externally.

In the second, timber posts set at approximately 600 mm intervals supported the roof structure whilst the gap between was built up with sun-dried earth bricks. In the last example timber posts were similarly set into the ground. Saplings were then fixed to the posts and run in hoops parallel to the ground about the inner and outer perimeters of the wall. The cavity thus formed was filled with packed earth and plastered over with daga.

No research in Swaziland proper has been possible to date. ate.

KwaNdebele

A structure which is unique to the Ndebele consists of a basic cylindrical drum whose walls are constructed from sun-dried earth bricks. The monolithic walls are load bearing and carry the timber roof-frame and thatch cover. The dwelling is extended by a further 1,000 m in the form of a verandah which curves on either side of the front doorway to run roughly two-thirds of the way around the inner drum. The roof is similarly increased in span to cover this area, the eaves usually being carried by timber posts set into a three-quarter height verandah wall.

Figure 71 a.

Other cone on cylinder dwellings recorded usually conform with the basic form common to most of the country, the drum walls being monolithic, load-bearing and of sun-dried bricks as previously described.

KwaZulu

Essentially most Zulu cone on cylinder house forms are similar differing only in their wall construction. Some roof variants were however also recorded.

Generally most Zulu cone on cylinders consist of a timber frame supporting a conical roof structure thatched over from the eaves upwards with the grass bundles being laid seed-end up. Various methods of wall construction were recorded.

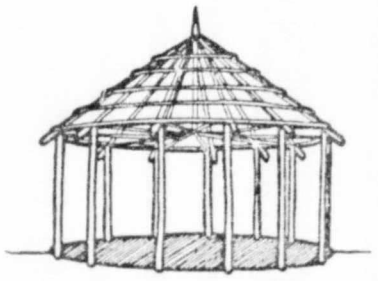
- The posts are set at approximately 600 mm apart along the circumference of the wall. The gap is then built up in stone slates laid as bricks and bonded in earth. The wall is either totally plastered with daga or is only plastered internally.
- The posts are set into the ground as above. Saplings are fixed to the posts and run in great hoops parallel to the ground about the inner and outer perimeters of the wall. The cavity thus formed is filled with either rubble, stone or packed earth. The wall can then be either totally plastered with daga or only plastered internally.
- "Major" or structural posts supporting the roof structure are set at approximately 600 mm along the circumference of the wall. "Minor" or non-structural posts are placed in between the major posts at approximately 150 mm spacing. Saplings are then closely woven between the uprights and parallel to the ground. The "basket" frame thus provided is finished with a coat of earth and daga, usually only internally.

Figure 68. Unit 12.

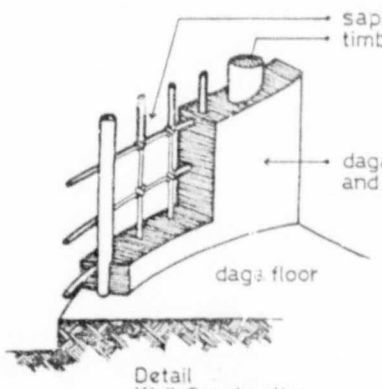
Two major but purely localized variations on the standard cone on cylinder were recorded, both in the Tugela Ferry district. In the one case the eaves line was relatively low and in order to give the doorway more head room the thatch was raised into what can best be described as the kind of roof line that would be achieved by thatching over a dormer window. In the second case, broad packed-earth panels were formed on either side of the door and were then painted with a red, white and green chevron pattern — an usage highly unusual in Zulu architecture but probably ascribable to the interest shown by the eldest son of the family in the Sotho highveld wall decoration he had come into contact with as a migrant labourer in the Transvaal.

Two roof variations were recorded. In the first, near Mfume, a group of cone on cylinders, although constructed in the normal manner, had roofs which were cladded over with galvanized iron, expanded oil tins and metal advertising sheets obviously plundered off the sides of a Johannesburg

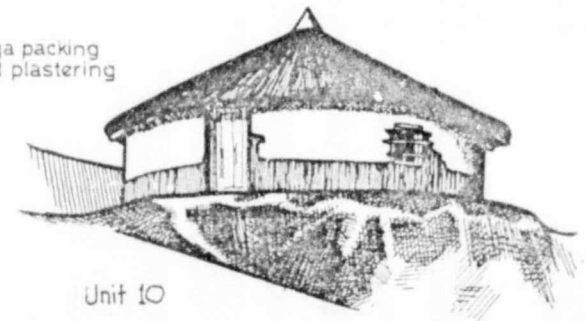
Cone-on-Cylinder: Unit 10.



Detail – Framework
Zulu: Cone on Cylinder
Nagle Dam Area



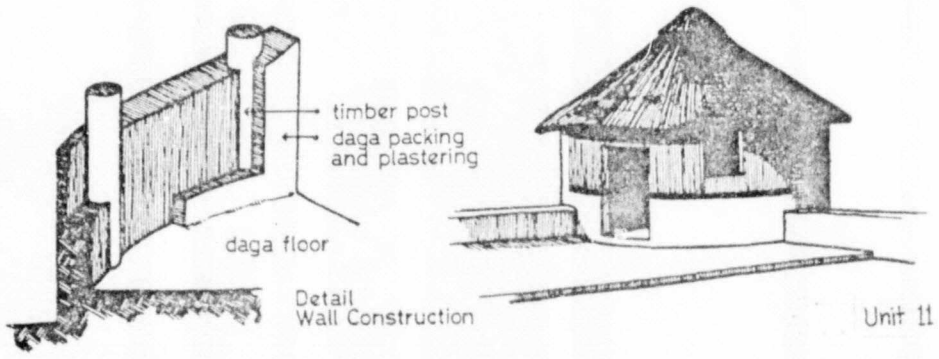
Detail
Wall Construction

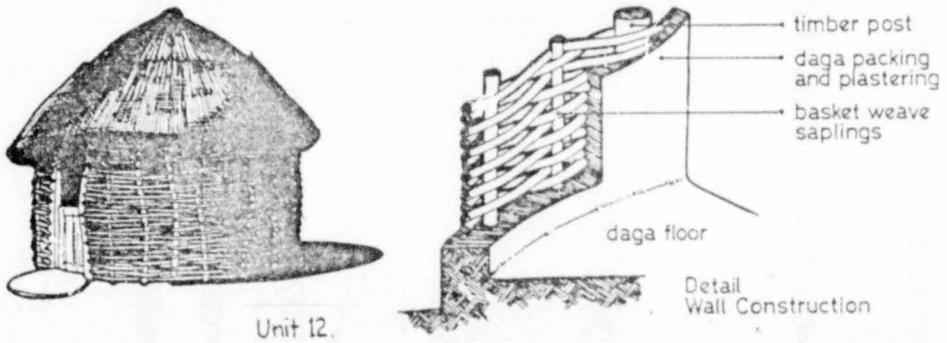


Unit 10

UNIT 10

- CLASSIFICATION : CONE ON CYLINDER
- LOCATION : NAGLE DAM, KWAZULU.
- CONSTRUCTION : TIMBER POSTS ARE SET INTO THE GROUND AT INTERVALS OF 1,500 m. SAPLINGS ARE FIXED TO THE INTERNAL OR EXTERNAL PERIMETER OF THE COLUMN RING, PARALLEL TO THE GROUND & SPACED BETWEEN 150 mm & 300 mm FROM EACH OTHER. FURTHER SAPLINGS ARE FIXED VERTICALLY TO THE HORIZONTAL MEMBERS THUS CREATING A SQUARE GRID. EARTH IS PACKED ON EITHER SIDE & THE SURFACE IS FINISHED OFF WITH A DAGA PLASTER APPLIED INTERNALLY & EXTERNALLY. THE ROOF BEAMS REST UPON THE TIMBER POSTS & ARE BROUGHT RADIALLY TO A CENTRAL CROWN. CROSS TIE BEAMS TRUSS THE ROOF AT EAVES HEIGHT & CARRY A CENTRAL POST FROM THE CROSSING TO THE ROOF APEX, LEAVING THE FLOOR CLEAR OF IMPEDIMENT.
- SOCIAL GROUPING : HOMESTEAD FOCUSED UPON A CENTRAL SOCIAL SPACE & ANIMAL ENCLOSURE. UNIT FUNCTIONAL AS LIVING/SLEEPING AREA.
- GENERAL : CONDITION OF UNIT - AVERAGE; CONDITION OF UNIT RELATIVE TO HOMESTEAD - GOOD. UNIT SITED ON SHARPLY SLOPED HILLSIDE THUS REQUIRING EARTH WORKS & BANKING.





Cone-on-Cylinder: Units 11 and 12.

UNITS 11 AND 12.

- CLASSIFICATION: CONE ON CYLINDER.
- LOCATION: UNIT 11 - SILWERKRANTZ, BOPHUTHATSWANA.
  UNIT 12 - PONGOLA, KWAZULU.
- CONSTRUCTION: IN UNIT 11, TIMBER POSTS ARE SET INTO THE GROUND AT INTERVALS OF 1,500 m. A MONOLITHIC PACKED EARTH WALL PANEL IS BUILT UP WITHIN THE GAPS. IN UNIT 12 TIMBER POSTS WHICH ARE ULTIMATELY TO CARRY THE ROOF LOAD ARE SET INTO THE GROUND AT APPROX. 900 m INTERVALS. NON-LOAD BEARING TIMBER POSTS ARE SET INBETWEEN. SAPLINGS ARE WOVEN HORIZONTALLY BETWEEN POSTS THUS CREATING A TIMBER BASKET FRAME. EARTH PACKING & A DAGA PLASTER ARE APPLIED INTERNALLY. IN BOTH CASES, ROOF BEAMS REST UPON THE TIMBER POSTS & ARE BROUGHT RADIALLY TO A CENTRAL CROWN. THE THATCH COVER IS LAID SEED-END UP.
- SOCIAL GROUPING: UNIT 11 FUNCTIONED AS A COOKING HUT & FACED ONTO A FRONT COURT SHARED WITH LIVING & SLEEPING QUARTERS. UNIT 12 FUNCTIONED AS LIVING/SLEEPING QUARTERS & FACED UPON AN INFORMAL FOCUS OF A CATTLE ENCLOSURE.
- GENERAL: CONDITION OF BOTH UNITS - GOOD; CONDITION RELATIVE TO THEIR RESPECTIVE HOUSEHOLDS - AVERAGE.

bus shelter. Externally the roofs were painted pink and red.

Figure 67.

The second and more important variation was recorded in the Nagle Dam area near Pietermaritzburg. A house whose construction was standard in every way for the area, was however of such diameter as to necessitate the trussing of the roof beams in addition to the introduction of a central supporting post. It was also of interest to note that in the same area, corrugated iron sheets were being used in the eaves of conical roofs. The positioning of these sheets did not seem to be related to either doorway position or house orientation nor did they appear to be fulfilling a functional purpose in the roof's structure or cladding. Enquiries on this point seemed to confirm the theory that this was a display of opulence and prestige and that once enough sheets had been acquired then the cone on cylinder dwelling would be replaced by "a modern house".

Lebowa

Figure 71 b.

Relatively few cone on cylinder structures were recorded in this region and even fewer were functional as residential quarters. In the main the family settlement consisted of one, two or three cone on cube structures clustered about a central square court which in its turn gave onto a smaller cooking court. The cone on cylinder in the group usually was sited off the cooking court and served as a kitchen.

Construction of the walls was by means of sun-dried earth bricks laid in earth mortar into a monolithic load-bearing wall. The timber roof frame was then laid on the cylinder thus formed and thatched from the eaves upwards with the grass bundles being placed seed-end up.

Qwa Qwa

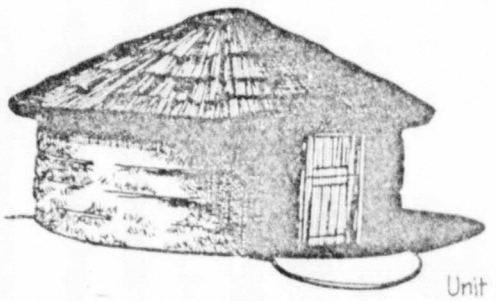
Figure 71 c.

Two house forms were recorded. In the first case the doorway was extended outward by some 400 mm with an arch being brought over the whole. The door itself remained at the level of the perimeter thus being shielded to a certain extent by the protruding nibs thus formed. A direct relationship could thus be drawn between this dwelling and the beehive house forms recorded amongst the Sotho from the early eighteenth century and described in an earlier chapter.

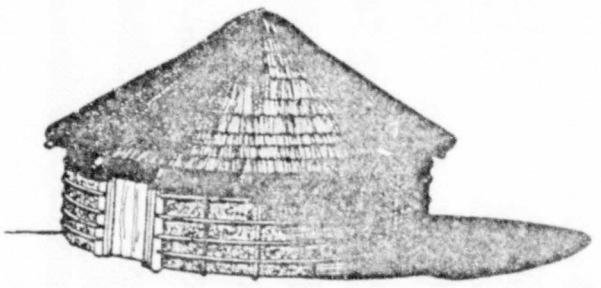
Figure 71 d.

The other form recorded was essentially a basic cone on cylinder but which had in many cases been embellished by forming two broad earth plaster panels on either side of the door and a similar surround to the window openings. The floor had in some cases been raised by as much as a full 1,000 m thus necessitating the use of the external steps.

Wall construction amongst the Sotho is mostly in the way of stone bonded

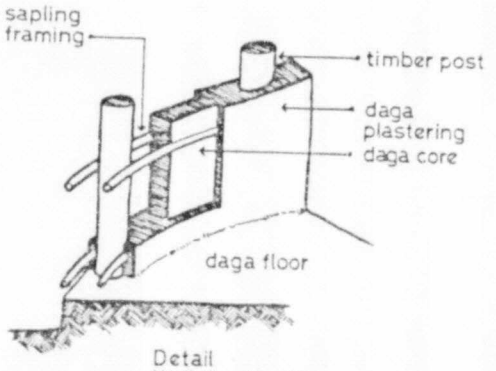


Unit 13.



Unit 14.

Cone-on-Cylinder: Units 13 and 14.

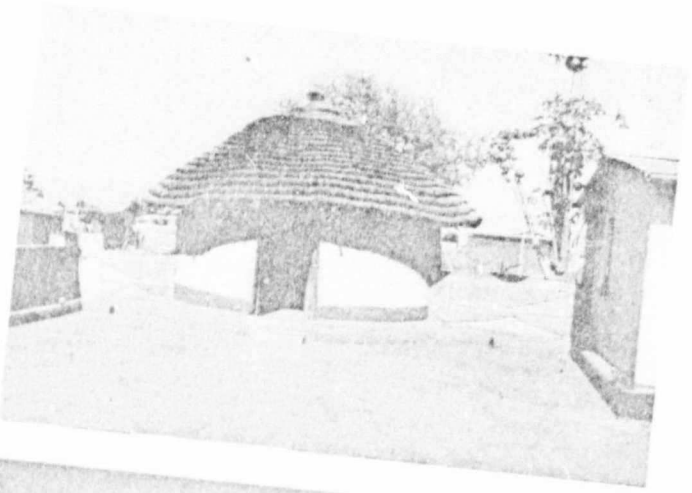


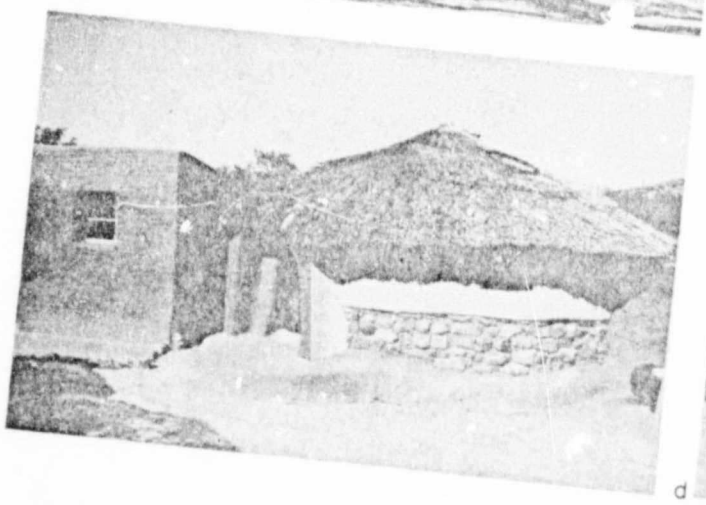
Detail
Wall Construction

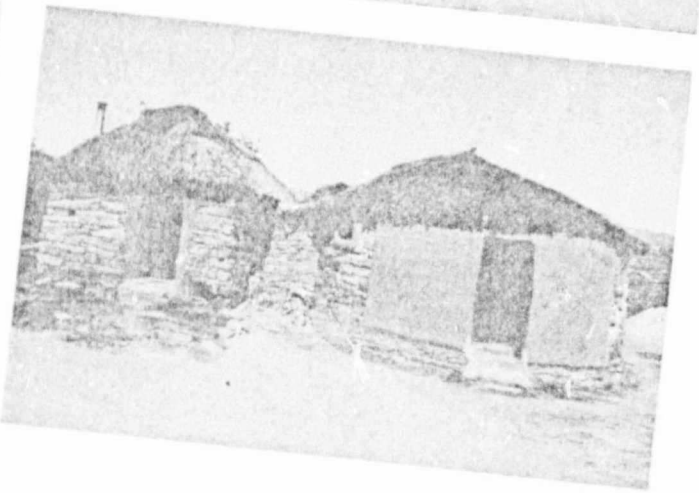
UNITS 13 AND 14.

- CLASSIFICATION : CONE ON CYLINDER
- LOCATION : UNIT 13 : PONGOLA, KWAZULU.
  UNIT 14 : GREYTOWN, KWAZULU.
- CONSTRUCTION : IN BOTH UNITS TIMBER POSTS WHICH ARE ULTIMATELY TO CARRY THE ROOF LOAD ARE SET INTO THE GROUND AT 1,200 m INTERVALS. SAPLINGS ARE FIXED TO THE INTERNAL & EXTERNAL PERIMETERS OF THE WALL, SPANNING FROM POST TO POST & PARALLEL TO THE GROUND SPACED 300mm APART. THE CAVITY THUS FORMED IS FILLED WITH EARTH & PLASTERED WITH DAGA. ROOF BEAMS REST UPON THE TIMBER POSTS & ARE BROUGHT RADIALLY TO A CENTRAL CROWN: SAPLING BATTENS SET IN CONCENTRIC CIRCLES CARRY THE THATCH COVER LAID SEED-END UP.
- SOCIAL GROUPING : IN BOTH CASES THE HOMESTEAD WAS LOOSELY CLUSTERED ABOUT A CENTRAL SOCIAL SPACE ADJOINING THE ANIMAL ENCLOSURE.
- GENERAL : BOTH UNITS BELONG TO HOUSEHOLDS WHOSE DWELLINGS ARE OF MIXED CLASSIFICATION. WINDOWS ARE SMALL & WOODEN SHUTTERED. CONDITION OF BOTH UNITS - GOOD ; CONDITION OF BOTH UNITS RELATIVE TO THEIR HOUSEHOLDS - AVERAGE.









a. Entry to Ndebele dwelling: Odi, Bophuthatswana.
b. Kitchen unit: Magongwa, Lebowa.
c. Dwelling: Witsieshoek, Qwa Qwa.
d. Dwellings: Witsieshoek, Qwa Qwa.

with earth. Depending on the availability of the right quality raw material, the stone can be used either in its natural state or dressed; in the case of the former the wall will usually be plastered over whilst in the latter's the stone masons skill will be allowed to show. It is not unusual to find the builder's name either carved on a plinth stone or rendered in a mosaic of small stone chips embedded into the wall.

Transkei

The Xhosa cone on cylinder form offers very few variations from the basic drum topped by a cone. What changes have been recorded are based largely on differences in wall construction methods, of which the following have been recorded:

- The timber framed cavity wall which can use either stone, rubble or earth as infill, the whole then being plastered over internally and externally with daga.
- Monolithic, load-bearing walls of sun-dried earth bricks similarly plastered over with daga as a finish. In such cases, the walls are thickened towards the base and given a buttressed appearance in order to take the lateral thrust of the conical roof.
- In the district of Herschel, cone on cylinder forms were recorded built in the dressed stone tradition of the Sotho. It is not however known whether this is the direct result of influence from Lesotho to the north or the import of foreign building methods gained from missionaries which come into this area towards the mid-nineteenth century.

Figure 73 b.

Venda

The Venda today still build their dwellings almost exclusively in the form of a cone on cylinder many with a verandah extending about the full perimeter of the house. It would be almost impossible to give full justice to the richness of the housing found in this region in the one short chapter set aside for it. For the sake of simplification therefore we can break up the Venda house form into four basic types.

- The standard cone on cylinder common to most of Southern Africa uses of a full range of window types and sizes and the construction methods are able to cope with the problems of introducing a lintel into a circular wall surface.

Figure 73 e.

- The cone on cylinder verandah house where the roof load is taken up by the drum wall as well as the verandah posts. Few sizeable windows were recorded in this type.

Figure 73 d.

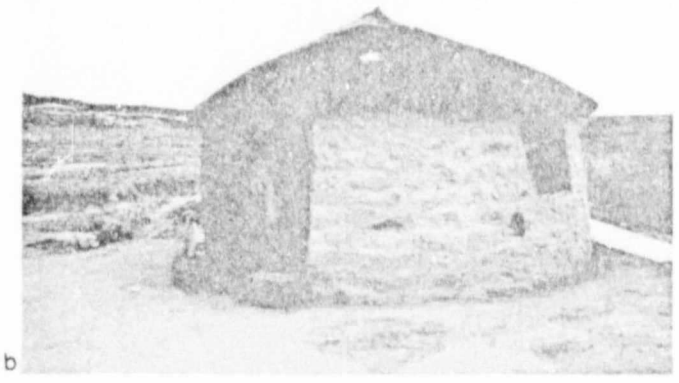
- An extension of this verandah house is the type which was traditionally built for chiefs of the land. In this form the verandah was enclosed for a full third to a half of the perimeter to the rear of the dwelling by a wall which rose to and encloses the eaves. This closed area was divided into two by an interior wall and doorways were placed at either end of the verandah, the rooms thus formed being used either by the chief's attendants or as storage. The verandah itself was enclosed by a half height wall running the external perimeter of the house. The hut roof would be plastered over internally and painted in bright concentric patterns. This house type is currently only known to us from historical records and reconstructions.

Figure 112 b.

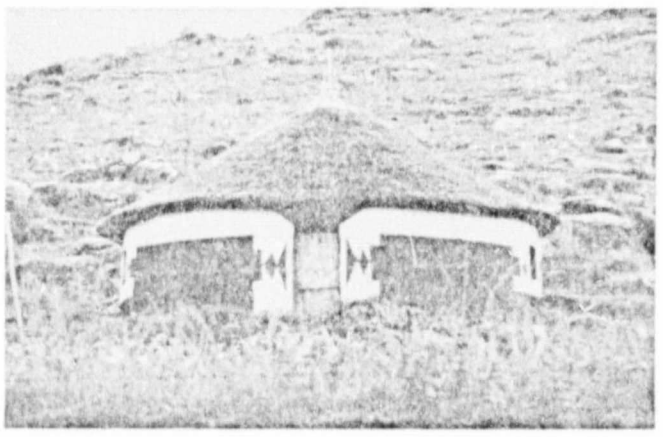
a. Reconstruction of cone-on-cylinder dwelling: Khami Hill, Zimbabwe (after Walton, *African Village* 1956).
b. Dwelling: district of Herschel, Transkei.
c. Dwelling: Mount Fletcher, Transkei.
d. Dwelling: Makuya, Venda.
e. Dwelling: Vhufuli, Venda.



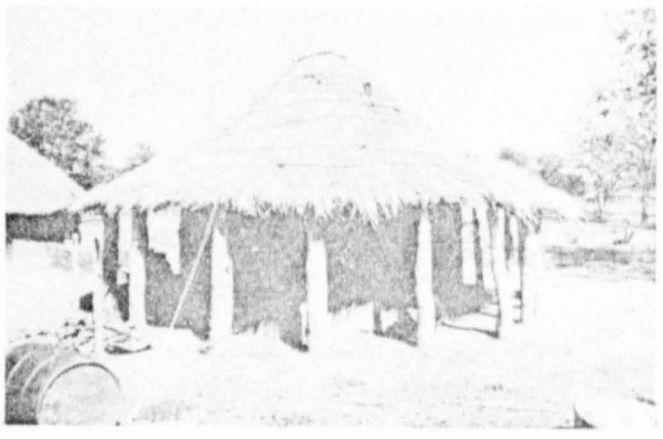
a



b



c



d



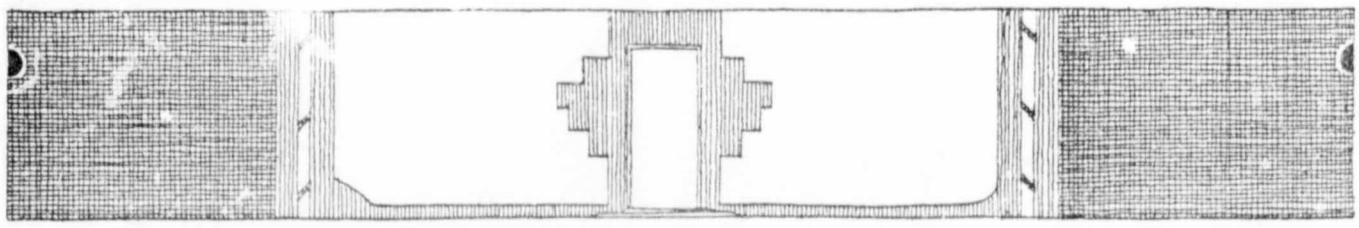
e

- The kitchen hut has, in a larger form currently also been recorded as an animal (goat) pen. This is essentially a verandah house but the internal load-bearing drum has largely been done away with leaving behind only some four or eight free standing post supports. The roof is carried at the eaves by a series of posts set at the house perimeter and built into a wall brought either half or full eaves height.

Perhaps of greater significance has been the transition that Venda architecture has undergone since legislation placed a curb on the use of the mopane tree in the region. Traditionally the Venda made extensive use of the mopane tree in their house construction both in their house walls and roof structures. However the danger of seriously deforestating the region, especially the more densely populated south, forced the home builder to seek new building materials. He found it in the packed-earth brick construction which may either be used sun-dried or better, kiln-fired. Kiln firing is done by taking the one thousand-odd bricks required for building a one-roomed structure, after they have been sun-dried for 7-10 days and stacking them into large oven-like structures leaving a tunnel at the bottom for firing. The whole bulky structure is plastered over with earth to plug all possible escape holes, reeds and grass are piled over the top and the sides to retain as much of the heat as possible and once the tunnel has been filled with timber, it is then fired and kept fired for three days. The kiln is allowed to cool and is then broken up, the bricks then being ready for us. The change to this new mode of construction is not yet total nor has it been painless as witnessed by events when, after a torrential rain, a number of houses, built either with no foundations or out of green or unfired bricks crumble and slide down on the hillsides of Venda.

Richard Tshivase (personal communication).

This chapter has seen a rapid and very generalized survey of the numerous regional variants of the cone on cylinder house form. Of necessity and for brevity's sake only the information deemed most important to this theme was included and a large number of variant house forms had thus to be grouped into more general categories.

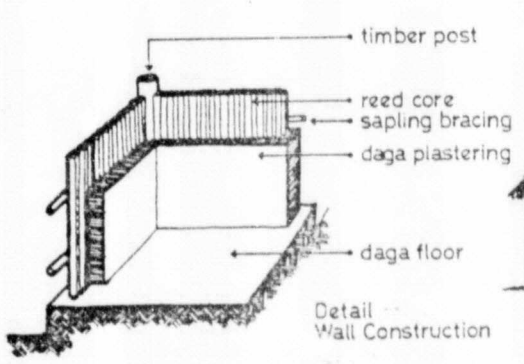


CHAPTER 10: SQUARES, HEXAGONS AND OCTAGONS

Although the cone on cylinder is currently the most widely built house form in Southern Africa, we find that in the context of a modern society, the circular floor plan presents considerable problems to the inhabitant in terms of furnishing the interior. In a society where mass produced furniture and fittings are based on the straight line and the 90° angle, the curved wall creates too many awkward corners and wasted spaces for it to be fully efficient. Therefore rural architecture, being the practical expression of a people's physical needs that it is, must set about excising wasted space and increasing the ability of the house's interior to respond more willingly to the demands of a new generation of rural inhabitants — a generation who on the one hand find their aspirations fired by increasing urbanization and better education and on the other are no longer prepared to sleep on a cow-dung floor and now actively seek the comforts available of a consumer society.

Although rural architecture is an architecture highly responsive to changing economic, technological and social circumstances, it is also generally the architecture of societies dominated by traditional values and culture. Traditions are not easily cast off and whilst rural society may find it desirable to bring change to its dwelling forms in order to meet up to changing circumstances, the forces of tradition dictate that the changes be neither sudden nor radical. Thus we find that although the rural dwelling begins to make concessions to the demands of modern furnishing, it is unwilling to make radical departures from the basic traditional house form.

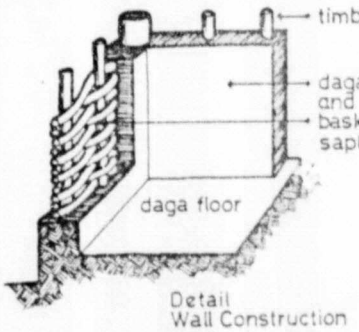
The unwillingness to implement too radical a change in the house form also stems from the very structure of rural society and the role that home-building plays within it. In such a society the technology of construction is learnt as part of the general education undergone by every member of that society. An awareness of building percolates to virtually every strata of rural life and cuts across lines of sex, age and social status, and even when specialised builders do arise, the average house holder and his family have



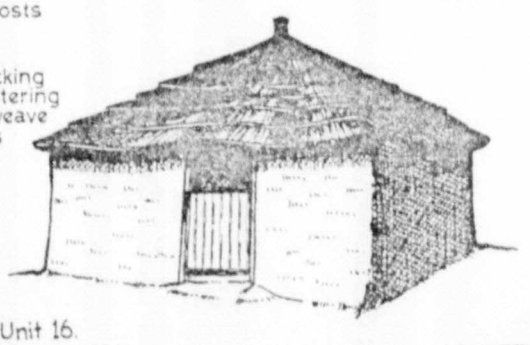
Detail
Wall Construction



Unit 15.



Detail
Wall Construction



Unit 16.

Cone-on-cube: Units 15 & 16.

UNITS 15 AND 16.

- CLASSIFICATION : CONE ON CUBE.
- LOCATION : UNIT 15 : KAAPMUIDEN, KANGWANE.
  UNIT 16 : PONGOLA
- CONSTRUCTION : TIMBER COLUMNS WHICH ARE ULTIMATELY TO CARRY THE ROOF LOAD ARE SET INTO THE GROUND AT 1,200 m INTERVALS. IN UNIT 15 A REED SCREEN LAID VERTICALLY IS SANDWICHED BETWEEN TWO SETS OF SAPLINGS LAID AT THE TOP & AT THE BOTTOM OF THE PANEL & PROTRUDING ON EITHER SIDE. THE WHOLE IS THEN SECURED TO THE TIMBER POSTS & EARTH PACKING & DAGA PLASTER IS APPLIED ON BOTH SIDES. IN UNIT 16 NON-LOAD BEARING POST AT 200 mm INTERVALS ARE PLACED INTO THE GROUND BETWEEN COLUMNS. SAPLINGS ARE THEN WOVEN HORIZONTALLY BETWEEN THE UPRIGHTS THUS CREATING A TIMBER BASKET FRAME. EARTH PACKING & DAGA PLASTERING ARE APPLIED ON BOTH SIDES. IN BOTH CASES ROOF BEAMS ARE BROUGHT RADIALLY TO A CENTRAL CROWN. THE THATCH COVER IS APPLIED SEED-END DOWN IN UNIT 15 & IN UNIT 16 THE THATCH BUNDLES ARE LAID SEED END UP & IMMEDIATELY SEWN DOWN THUS GIVING THE ROOF A SHINGLED OR LAYERED APPEARANCE.

an intimate knowledge of the building process and are able to take part in it. Each family member has his own assigned task: in a Zulu society the children and old people will weave grass ropes and mats whilst singing memory-training songs at night; the men will build the sapling framework to the beehive hut; the women will do the thatching and securing of the grass ropes. The skills handed down from father to son, from mother to daughter are difficult to cast off in a society that worships the ancestral spirits and youths accept the discipline of older generations without dissent. Thus any change in house form which may necessitate a new technology being invented will be discouraged and only minor advances or variations on the building methods of earlier generations will be tolerated.

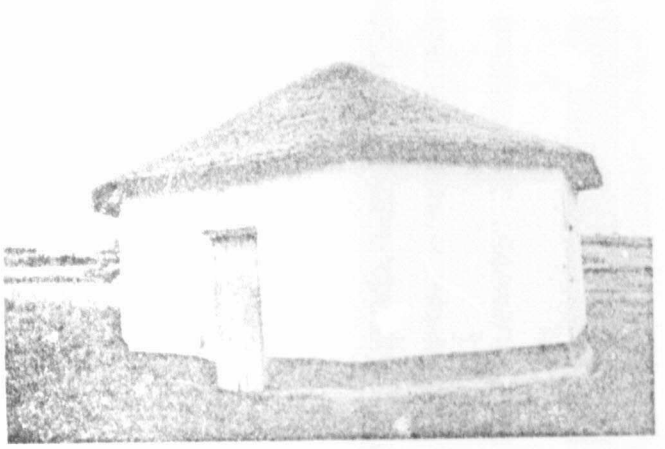
This might explain why at this stage rural architecture would or could not depart from the limitations of a basic conical roof, for the next stage of development would involve the invention of a truss and major technological adaptations to the demands of a ridged-roof structure. We therefore find that the house form almost reluctantly gives way to innovation as at first octagonal and later hexagonal plan houses are created almost as attempts to forestall the full commitment to the modern housing needs represented by the cone-on-cube form.

The hexagonal and octagonal house form

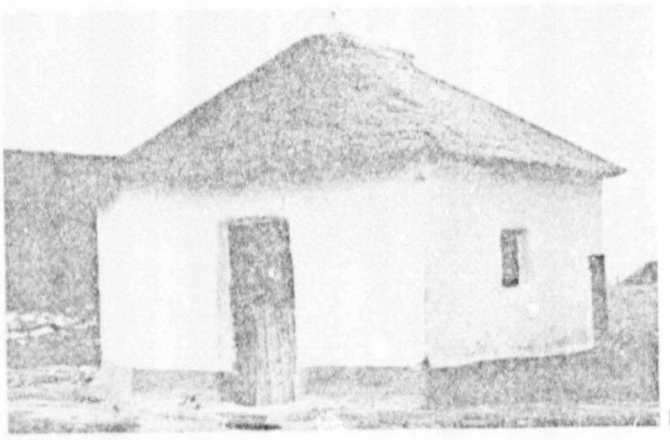
These have been recorded only as scattered examples in areas of the Ciskei, Transkei, KwaZulu and KaNgwane, differing only in their methods of wall construction and roof covering. Generally the full spectrum of wall building methods as described in the previous chapter have been recorded in connection with both types of floor plan whilst roofs cladded in both corrugated iron and thatch were found.

Figures 78 a. b.

Structurally these house forms do not seem to present much of a problem to the rural builder, their geometry being but a slight adaptation of the cone on cylinder. Their significance lies in their greater functionality of floor plan, a greater economy of space being possible when modern mass-produced furnishings are introduced. The average internal layout in hexagonal plan homes consisted of a doorway at the head of the plan; the wall directly opposite the door was occupied by a wardrobe or a welsh dresser; the two walls on either side of the dresser were fenestrated and the two walls on either side of the doorway were occupied by beds. It is also significant to note that in virtually every case of this house variant noted, the interior was functional as a bed/sitting room and was furnished with commercially obtainable units. In one case a grass mat ceiling was used.



a



b

a. Hexagonal dwelling: Katkop, Transkei.
b. Octagonal dwelling: Lady Frere, Transkei.

The cone-on-cube

Essentially there is little to differentiate between the cone-on-cylinder, the hexagonal and octagonal house drums and the cone-on-cube other than their respective floor plans. In all these types the limitations of a roof technology help determine the size and shape of the dwellings and virtually the same problems of water exclusion at the crown arise. In the cone-on-cube however there is the added problem of turning the thatch about a 90° corner, a problem which seems to have been resolved satisfactorily in most of the examples recorded.

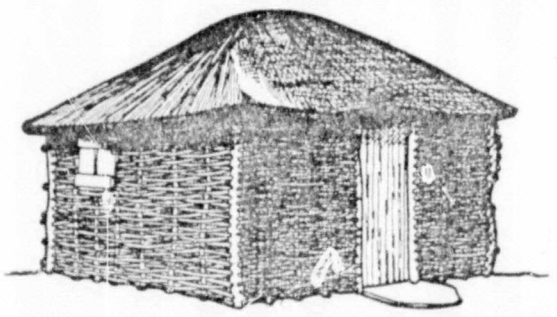
However, the transition from a round to a square floor plan is in itself significant and is a major stage in the development of the rural dwelling.

This stage can be said to mark the end of the development of the rural "hut" and the beginnings of the modern "house". One of the major weaknesses of the circular floor plan is that it does not encourage organic growth of the dwelling. Thus each unit (room) must of necessity stand on its own and any expansion needs can only be met by a duplication of units. The square floor plan however does facilitate expansion by the simple means of adding onto the existing unit and although the cone-on-cube is generally as limiting as the cone-on-cylinder in this respect, it is the first development which will ultimately lead to an organically-expandable house.

The actual process of transition from the circular floor plan of the cone-on-cylinder to the square of the cone-on-cube is open to debate. It is possible that the improved performance of the hexagonal and octagonal floor plans are pointers in this direction, and that it is the internal demands



Unit 17

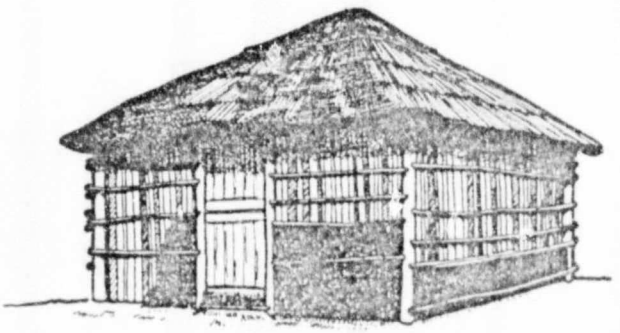


Unit 18.

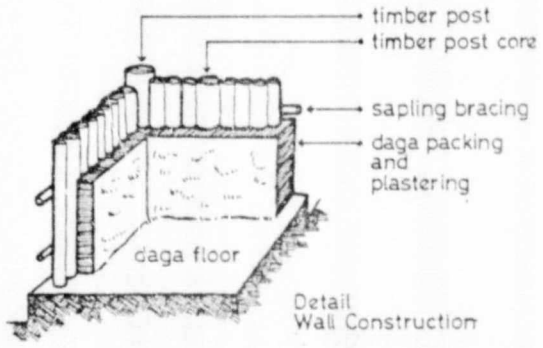
Cone-on-cube: Units 17 and 18.

UNITS 17 AND 18

- CLASSIFICATION: CONE ON CUBE.
- LOCATION: UNIT 17 : MARICO
  UNIT 18 : PONGOLA.
- CONSTRUCTION: IN UNIT 17 THE ROOF LOAD IS CARRIED BY THE PERIMETER OF TIMBER COLUMNS WHICH STAND PROUD OF THE MONOLITHIC PACKED EARTH WALL WITHIN. IN UNIT 18 TIMBER COLUMNS WHICH CARRY THE ROOF LOAD ARE SET INTO THE GROUND AT INTERVALS OF 1200 m. NON-LOAD BEARING POSTS ARE SET VERTICALLY INTO THE GROUND AT 300 mm INTERVALS. SAPLINGS ARE WOVEN HORIZONTALLY BETWEEN THE UPRIGHTS TO FORM A TIMBER BASKET FRAME. EARTH PACKING & DAGA PLASTERING ARE APPLIED INTERNALLY ONLY. THE ROOF BEAMS ARE BROUGHT RADIALLY TO A CENTRAL CROWN. THE THATCH COVER IS LAID SEED-END UP. IN UNIT 17 THE CROWN THATCHING HAS NOT BEEN RESOLVED.
- SOCIAL GROUPING: UNIT 17 SHARES A CENTRAL COURT WITH ANOTHER SIMILAR DWELLING. UNIT 18 FACES ONTO AN INFORMAL CENTRAL SPACE.
- GENERAL: WINDOWS ARE SMALL & TIMBER SHUTTERED. CONDITION OF UNIT 17 - POOR; UNIT 18 - GOOD. CONDITION OF BOTH UNITS RELATIVE TO RESPECTIVE HOUSEHOLDS - AVERAGE.



Unit 19.



Detail
Wall Construction

Cone-on-cube: Unit 19.

UNIT 19.

- CLASSIFICATION : CONE ON CUBE.
- LOCATION : PIET RETIEF.
- CONSTRUCTION : TIMBER POSTS ARE PLACED IN CLOSE ORDER TO FORM THE WALL PERIMETER. HORIZONTAL BRACING IN THE FORM OF TIMBER SLATS IS PLACED INTERNALLY & EXTERNALLY ALONG THE WALL PERIMETER. EARTH PACKING & DAGA PLASTERING ARE APPLIED ON BOTH SIDES. ROOF BEAMS ARE BROUGHT FROM THE EAVES RADIALLY TO A CENTRAL CROWN. SAPLING BATTENS CARRY THE THATCH COVER LAID SEED-END UP.
- SOCIAL GROUPING : NO PATTERN COULD BE FOUND TO HOUSEHOLD.
- GENERAL : FLOOR LEVEL WAS RAISED APPROX. 200mm ABOVE NATURAL GROUND LEVEL. WINDOW SMALL & TIMBER SHUTTERED. DOOR OF THE SPLIT OR "STABLE" TYPE. EAVES PACKING MADE USE OF EMPTY COLD-DRINK TINS. UNIT WAS UNDER CONSTRUCTION BUT WAS INTENDED TO FUNCTION AS A LIVING/SLEEPING SPACE. RESIDENTS OF HOUSEHOLD DESCRIBED THEMSELVES AS SWAZI.

of the house that are now dictating the shape of the plan. This was undoubtedly true in many of the cases recorded during this study, but in equally as many cases, there was little if any noticeable difference between the lifestyle of inhabitants of square-plan and that of circular-plan houses within the same settlement grouping.

The answer must lie partially with the theory of a structural evolution of the house and partially with the cultural cross-pollination that must inevitably take place in a country whose people come from such diverse backgrounds as is the case in Southern African society. The architectural manifestations of such a society need not only develop by evolution but also by assimilation — the borrowing of one group's forms by another. It is therefore more than just possible that the introduction of a squre plan in some areas was the result of a direct and unabashed interpretation of the house forms of another group.

The exact time-scale of such an influence is difficult to determine. Certainly missionaries and trek-boers built square-plan houses on the Highveld as early as the 1830's but little impact seems to have been made until the major mining industrial areas of Kimberley and the Witwatersrand began to develop from the 1870's onwards. The demand for labour and a series of droughts and plagues of locusts and the Rinderpest forced many a rural dweller faced with starvation to seek work in the developing urban areas. It would seem that the introduction of the square floor plan in the rural environment dates from this period onwards.

It is undeniable that some kind of cultural snobbery is involved in determining what kind of house form the rural dweller has or is going to build. On several different occasions during the course of the field research for this study the square-plan house was held up to be a paragon of civilized living over the circular-plan, often by the use of usually insulting and racist adjectives.

Perhaps the best example of a wilful and deliberate switch in floor plans was recorded in Makgobistad, Bophuthatswana, west of Mafikeng. There the structurally separate conical roof supported by verandah posts had been retained. The circular drum of the house beneath had been demolished and replaced with a cube, the corners of which were cunningly projected to the limit of the eaves in between the columns. The builder however was not able to understand why the line between roof and wall took on such a strange geometry.

It is the change in geometry that ultimately is the important factor in this state of the development of the house form. Up to and prior to the cone-on-cube the roof was based upon the geometry of a circle. The cone was able

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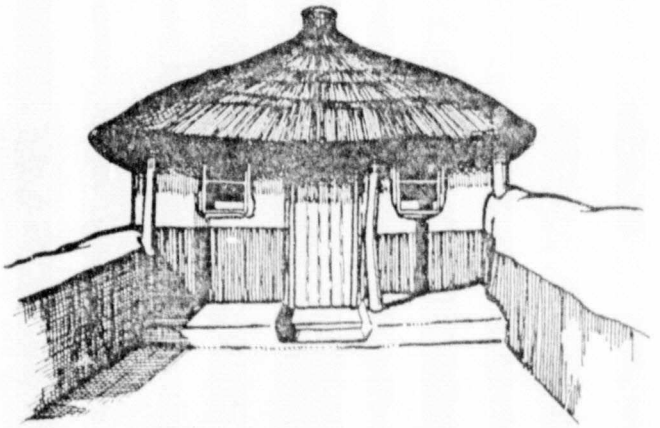
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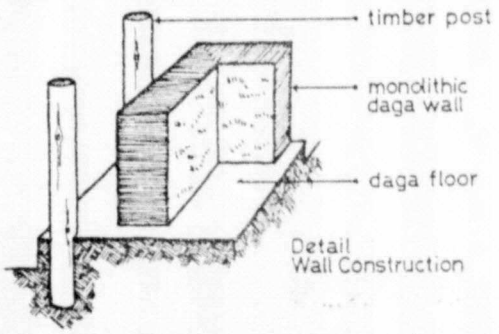
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Unit 20.



Detail
Wall Construction

Cone-on-cube: Unit 20.

UNIT 20

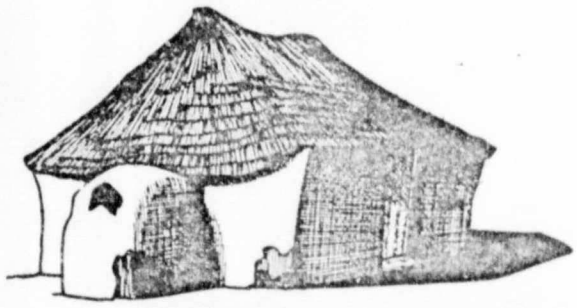
- CLASSIFICATION: CONE ON CUBE.
- LOCATION: BUSHBUCKRIDGE. LEBOWA.
- CONSTRUCTION: TIMBER COLUMNS WHICH CARRY THE ROOF LOAD ARE SET AT 1500 m INTERVALS ALONG THE PERIMETER. IN THE FRONT OF THE UNIT THE COLUMNS STAND PROUD OF THE WALL WITHIN BUILT IN NON-LOAD BEARING PACKED EARTH PLASTERED WITH DAGA. TO THE OTHER THREE WALLS OF THE UNIT THE COLUMNS ARE BUILT WITHIN THE WALL WHICH ACTS AS AN INFILL PANEL. ROOF BEAMS ARE BROUGHT FROM THE EAVES RADIALLY TO A CENTRAL CROWN. THE THATCH COVER IS LAID SEED-END UP. THE CROWN IS FINISHED WITH A TOP-KNOT WHICH GATHERS & FINISHES THE THATCHING. FLOOR IS RAISED APPROX. 150 m m ABOVE NATURAL GROUND LEVEL.
- SOCIAL GROUPING: UNIT SHARES A CENTRAL COURT WITH A SIMILAR UNIT, & FUNCTIONS AS A LIVING/SLEEPING SPACE.
- GENERAL: CONDITION OF UNIT - GOOD ; CONDITION RELATIVE TO GENERAL AREA - ABOVE AVERAGE. WINDOWS ARE GLAZED STEEL COTTAGE SECTIONS FACING ONTO THE CENTRAL COURT. SOIL IN THE AREA IS SANDY & NOT VERY SUITABLE FOR BUILDING.

to rest comfortably upon the cylindrical drum and the structure was in equilibrium, all forces of the roof being able to be distributed equally about a circular wall. This ceases to be the case however with the cone-on-cube. Here the conical roof rests upon four points, the corners of the walls. The junction line between wall and roof becomes subject to adjustment which only becomes structuraliy acceptable when the cone takes on the form of a pyramid. The stresses between roof and wall structure are increased. The equal distribution of the load that occurred in the cone-on-cylinder led to whatever wall deformation that did take place, to occur uniformly about the roof line. This is no longer possible in the cube where, although the major part of the stress is taken up by the four structurally strong corners, some stress is inevitably distributed to the straight wall spans in between.

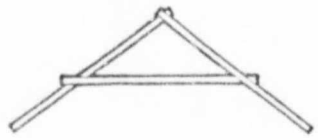
In most examples recorded, deformation of the wall at this point had occurred. Quite clearly the methods of building the conical roof with minimal trussing are no longer acceptable in the cone-on-cube form and some form of effective trussing becomes necessary.

It would serve no purpose to recount the various constructional systems used in this house form. It is sufficient to say that very few if any variants were recorded in roofs, the vast majority being thatched and that the walls were largely built in the same manner recorded under the cone-on-cylinder, being subject to the same kinds of regional limitations.

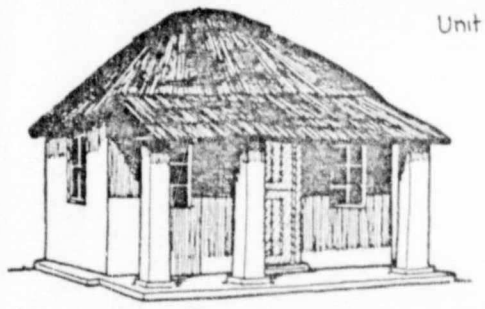
The switch over to a square plan must be considered to be a significant development in rural architecture for it marks the stage when the roof ceases to be a major determinant of the dwelling's form and, for the first time in this evolutionary process, becomes subjugated to the demands of the floor plan. This is indicative of an increasing sophistication on the part of the rural dweller in terms of life-style and economics, which in its turn finds architectural expression in the demands being made upon the rural habitat. At first these demands may be relatively uncomplicated: that the dwelling have a "modern" aesthetic externally and house the owner's activities and material possessions efficiently. But as the nature and values of rural society change so then too do the demands of rural man become increasingly reflected in his house form.



Unit 21



Detail
Roof Construction



Unit 22.

Ridged and hipped roof: Units 21 and 22.

UNITS 21 AND 22.

- CLASSIFICATION : RIDGED & HIPPED ROOF.
- LOCATION : UNIT 21 : DISTRICT OF BALFOUR.
  UNIT 22 : SILWERKRANTZ.
- CONSTRUCTION : IN UNIT 21 TIMBER POSTS ARE SET INTO THE GROUND. A REED SCREEN LAID VERTICALLY IS SANDWICHED BETWEEN SAPLINGS LAID TO THE TOP & BOTTOM OF THE PANEL PROTRUDING ON EITHER SIDE. THE PANEL IS FASTENED TO THE TIMBER POSTS & AN EARTH PACKING & DAGA PLASTER IS APPLIED BOTH INTERNALLY & EXTERNALLY. IN UNIT 22, THE WALLS ARE BUILT IN LOAD-BEARING SUN-DRIED EARTH BLOCKS BONDED IN EARTH & PLASTERED OVER WITH DAGA. THE ROOF TRUSSES ARE TIED IN THE SHALLOW UPPER THIRD OF THE ROOF VOID & IN THE CASE OF UNIT 21, THE ROOF STRUCTURE IS NOT VERY EFFICIENT. HERE THE BEAMS HAVE SPREAD & THE WEIGHT OF THE ROOF HAS FORCED THE WALLS OUTWARD LEADING TO THE FUTURE THREAT OF STRUCTURAL COLLAPSE. THE THATCH IS LAID SEED-END UP.
- SOCIAL GROUPING: UNIT 22 FACED ONTO A CENTRAL COURT. NO PATTERN OF HOUSEHOLD WAS EVIDENT IN UNIT 21. BOTH UNITS FUNCTIONED AS LIVING/SLEEPING AREAS.
- GENERAL : BOTH UNITS MAKE USE OF GLAZED WINDOWS.

Author Frescura Franco
Name of thesis The Development Of Rural Vernacular Architecture In Southern Africa. 1980

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