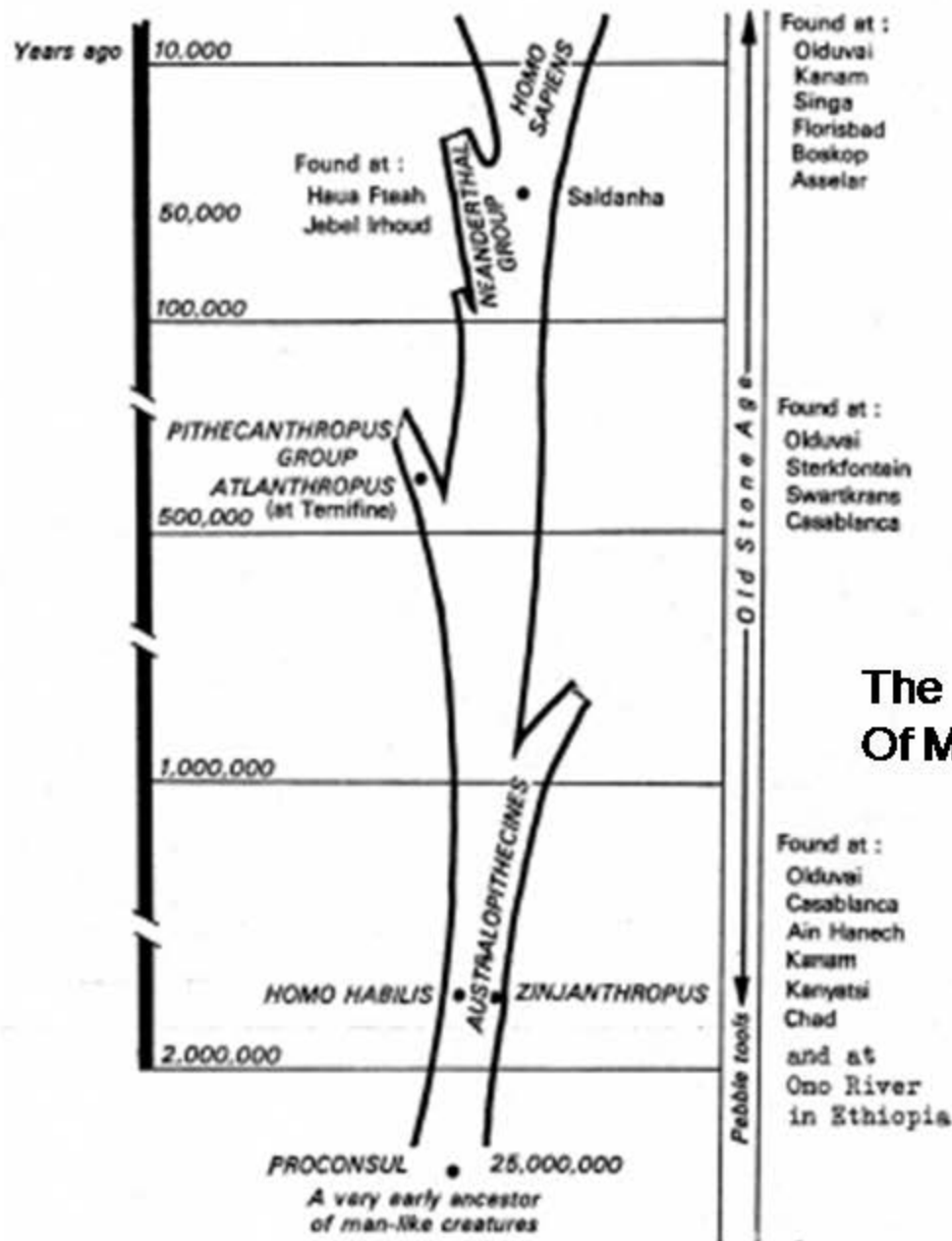


Ethiopian Architecture

Bernhard Lindahl



The Development Of Mankind in Africa

The Birth of Mankind

The development of man in Africa

The Birth of Mankind

- Mankind's first development= somewhere in the eastern side of Africa
- In 1967 Jaw bones & teeth was found near Omo River
- Primitive stone tools found together with them= may date as far as 2 million years
- One living floor was found in 1969 on the southern bank of Omo river (Melka Konture)= 100,000 years old

Earliest Prehistoric Culture



**Where the remains of the
Earliest men have been
found**



3. Stone hand-axe ("biface") of black glassy obsidian, as found at Melka Konture. Obsidian gives a particularly sharp edge, but tools of other kinds of stone were also common

Earliest Art

- The oldest ones are found mostly in Harar-Dire Dawa & Ogaden direction



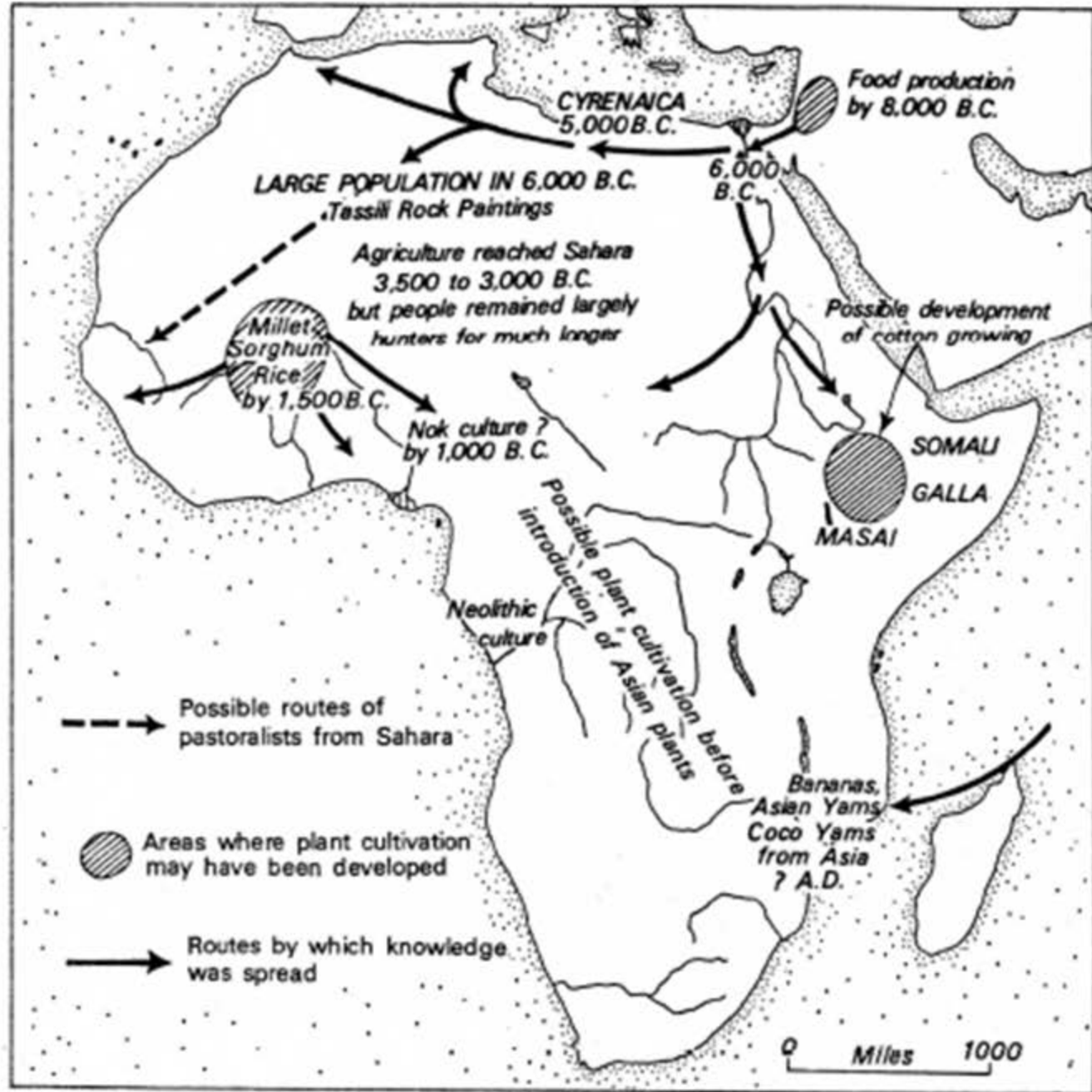
The pictures above are reproduced from one of the limestone caves at the bottom of the escarpment to the west of Dire Dawa.

The pictures below are from a cave at Urso near Harar. The original is painted with black colour.



Agriculture first-Architecture later

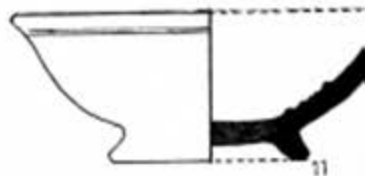
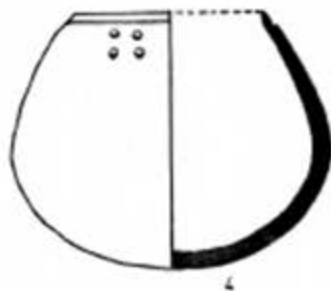
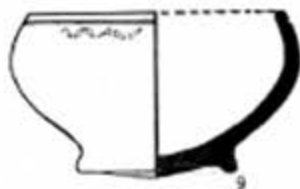
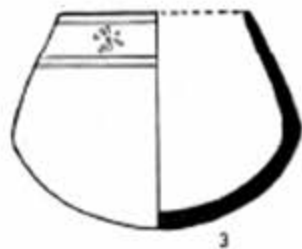
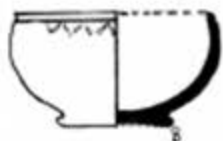
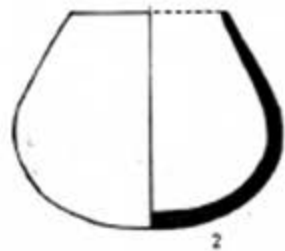
- Agriculture is necessary for settlement, & at least a part of the population must be permanently settled before architecture, other than the simplest shelters, can be expected to develop
- Regular farming in Nile delta= 4000 BC
- Ethiopia had its very early cultural connections= north along the Nile+ Westwards towards Sudan & sahara
- There were very few connections over to the network of routes in Southern Africa



Farming and the Neolithic period in Africa

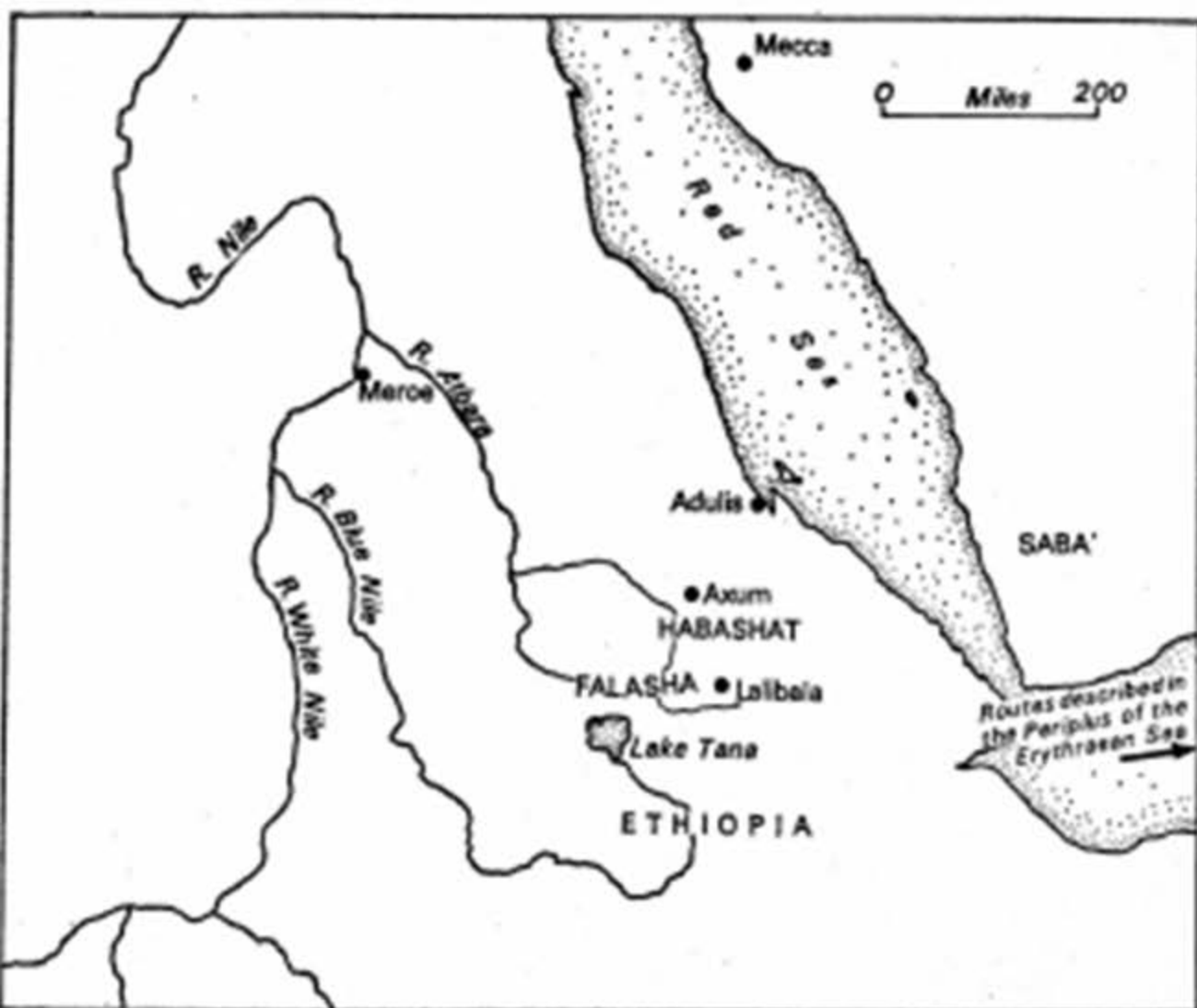
Pottery- the archaeologists time marker

Fragments of pottery are usually present in the soil of formerly inhabited places. New generations of people invent new shapes and patterns for their household pottery. Broken fragments become buried in the ground, stay there, and do not disintegrate. They will help to tell the relative age of each particular layer so that layers of the same age can be recognized from one excavated site to another. It has not yet been possible to correlate ancient Ethiopian types of pottery to an absolute scale of time.



0 5 10 15 CM.

Archeological Sites in Northern Ethiopia

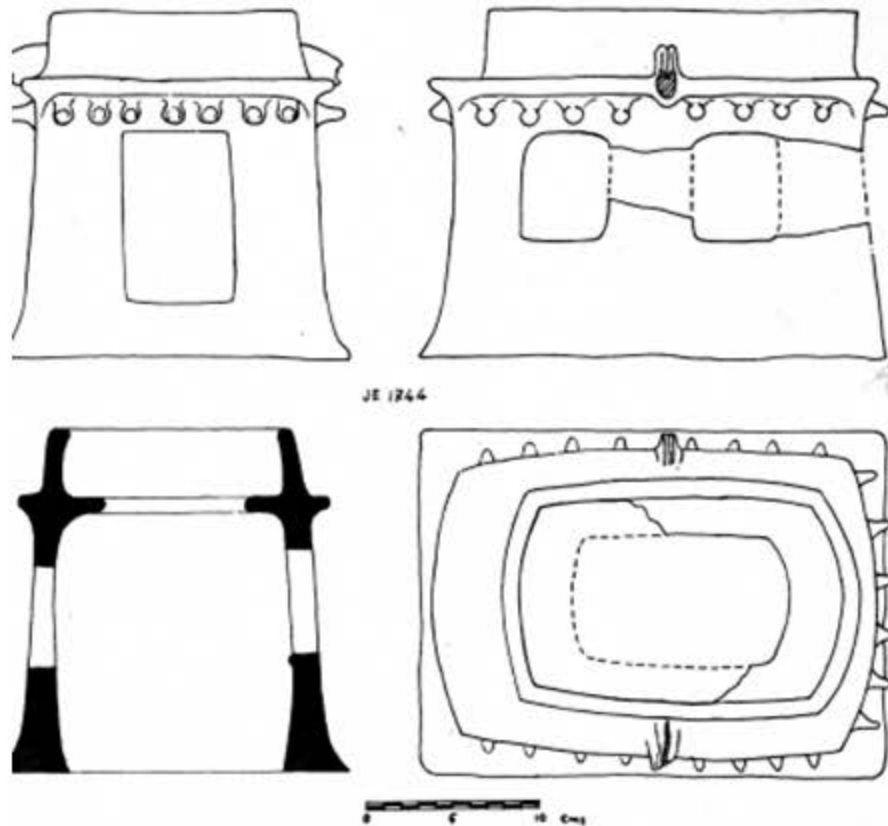




Earliest Reproduction of a building

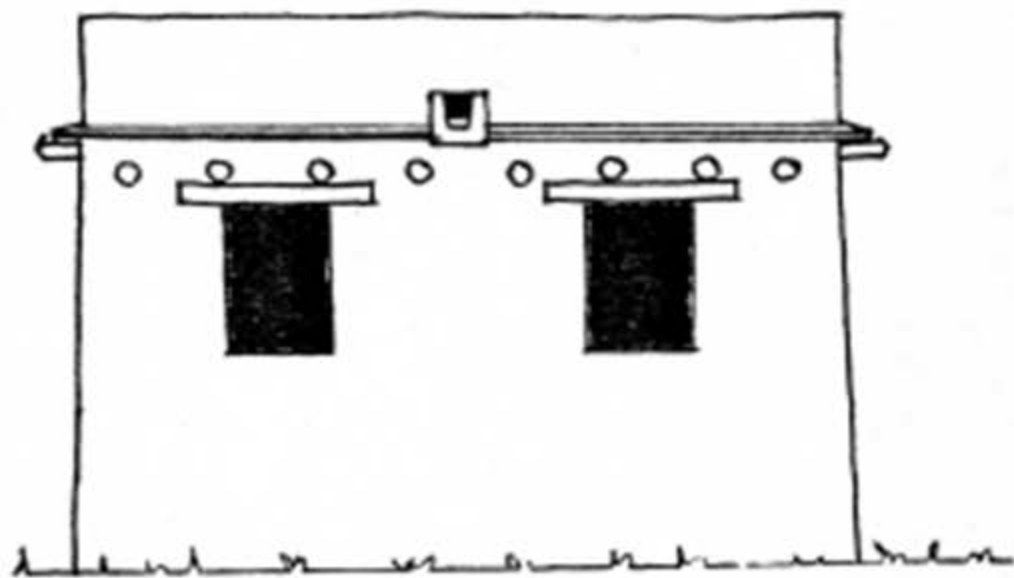
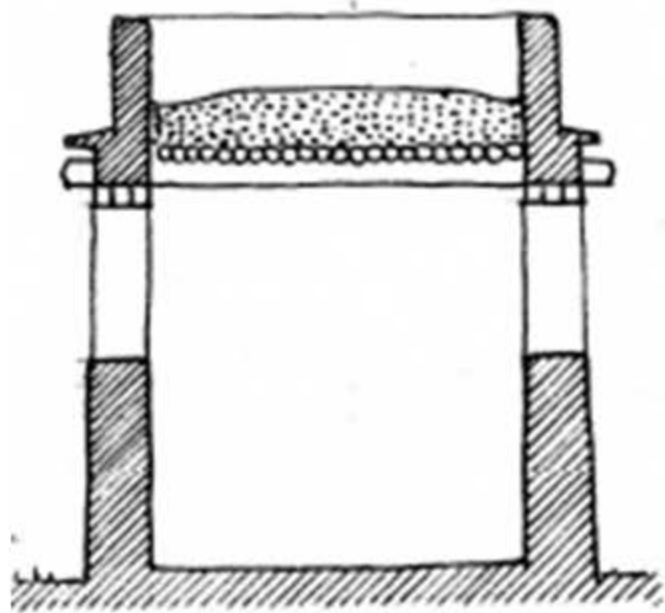
Sabean or Intermediate Period 500BC-100

AD



Modèle de maison en terre cuite (J.E., 1744).

The figures above represent a model (of burnt clay) of a house. This object was found near Aksum in 1959 and is about 25 cm long. It is probably the oldest preserved reproduction of an Ethiopian dwelling house. Its type is not very different from traditional flat-topped farmers' houses as constructed in Tigre still today. Below is a tentative reconstruction by B. Lindahl.



Influence from the east During the ethiopian-Sabeian period 500-300BC

- The strongest pre-Christian influence on Ethiopia= Semitic influence from South Arabia upon the northern highlands of Ethiopia



A South Arabian tablet for offerings (above) contains among other ornaments a frieze of heads of animals. Such friezes were often used e.g. at Yeha in Ethiopia, depicting especially i b e x which was something of a sacred animal in Ethiopian-Sabean culture. (The ibex or walia should be called sacred still today in a certain sense, because it is now near extinction and must be strictly protected in the game reserves in the Semien mountains.)

Bronze objects designed on the same principle as the one above were found several in graves at Yeha:

Sabean letters forming a composition which expresses the owner's name in the shape of an animal.

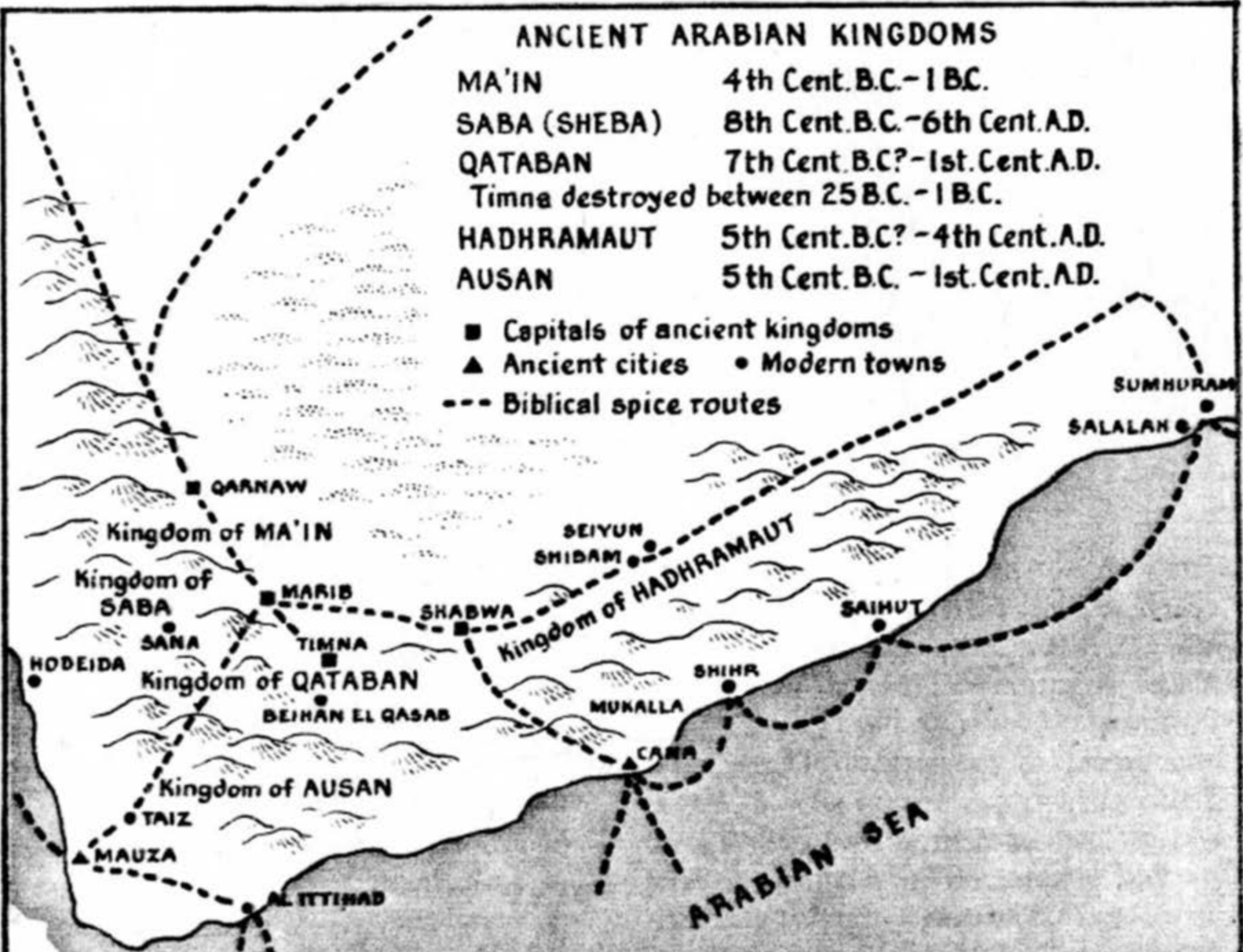


- The remains of ancient Arabian cultures have not yet been all excavated, the location of their palaces in present day Yeman is known= The parallels with ancient designs of northern Ethiopia is striking

ANCIENT ARABIAN KINGDOMS

MA'IN	4th Cent. B.C. - 1 B.C.
SABA (SHEBA)	8th Cent. B.C. - 6th Cent. A.D.
QATABAN	7th Cent. B.C.? - 1st. Cent. A.D.
Timna destroyed between 25 B.C. - 1 B.C.	
HADHRAMAUT	5th Cent. B.C.? - 4th Cent. A.D.
AUSAN	5th Cent. B.C. - 1st. Cent. A.D.

- Capitals of ancient kingdoms
- ▲ Ancient cities ● Modern towns
- Biblical spice routes





Examples of
design:
ancient coin
from South
Arabia (above)
and a Sabean
necklace



Symbols of Sabean Religion



A stone altar found
in Azbi-Dera bearing
Symbols of the Sabean
Religion (Crescent & A
disc

Symbols of Sabean Religion

- The decoration of the altar is clearly architectural & depicts “Aksumite” type of window carpentry similar to the patterns of the largest steles at Aksum
- The decoration of the altar probably symbolizes a temple or a palace

A stele standing at Matara near Senafe containing symbols of the Sabean Religion



Stèle de Matara.

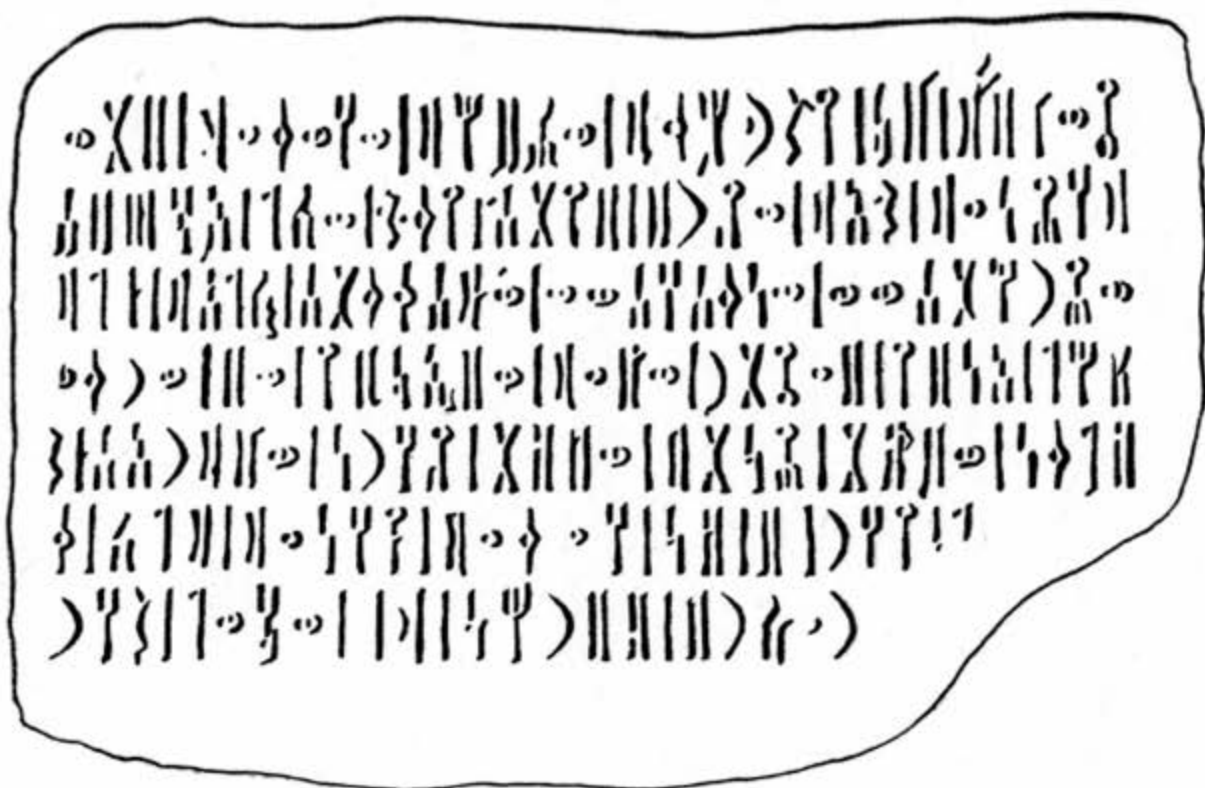


Symbols of Sabean Religion

- Steles, including also the giant ones at Aksum, were a kind of grave monuments or tall slender tombstones
- The largest ones were fitted with platforms at the base, & some of these platforms had bowls & other arrangements for ritual offering of animals & probably also of vegetable products

The Sabean Script arrives across the Red Sea

Ethiopian-Sabean Period, approximately 500 - 300 B.C.



1. Sabean inscription on stone from South Arabia

The Sabean Script arrives across the Red Sea

Inscription in Sabean script from an altar found not far from Aksum in Ethiopia and dedicated to the Sabean god *A l m u q a h*.

Note the zig-zag method of reading, with even the letters themselves turning one way and the other "like the ox when ploughing".

(This ancient geometric-type script would have been easier than present Amharic script to adapt for architect's and engineer's technical lettering with stencils on drawings!)

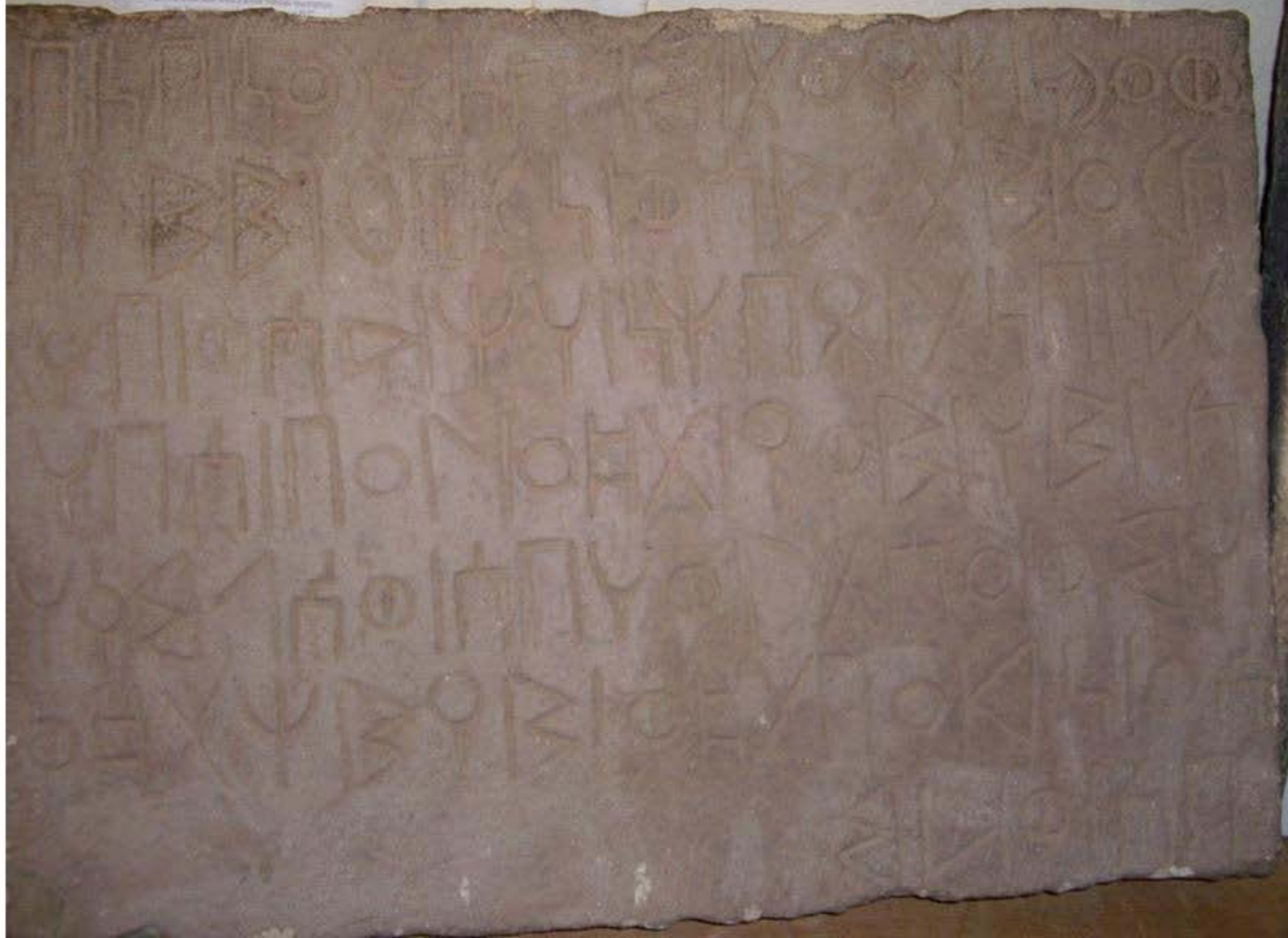
The Sabean Script arrives across the Red Sea

**Inscription in Sabean script
From an altar found not far
From Aksum in Ethiopia dedicated
To the Sabean god ALMUQAH**

**Zig zag way of reading, with
Even the letters themselves
Turning one away the other " like
The ox when ploughing"**



Tablet with Sabean writing found in Ethiopia



Sabean Script became Geez Script

Ethiopian script born around 200-300 AD

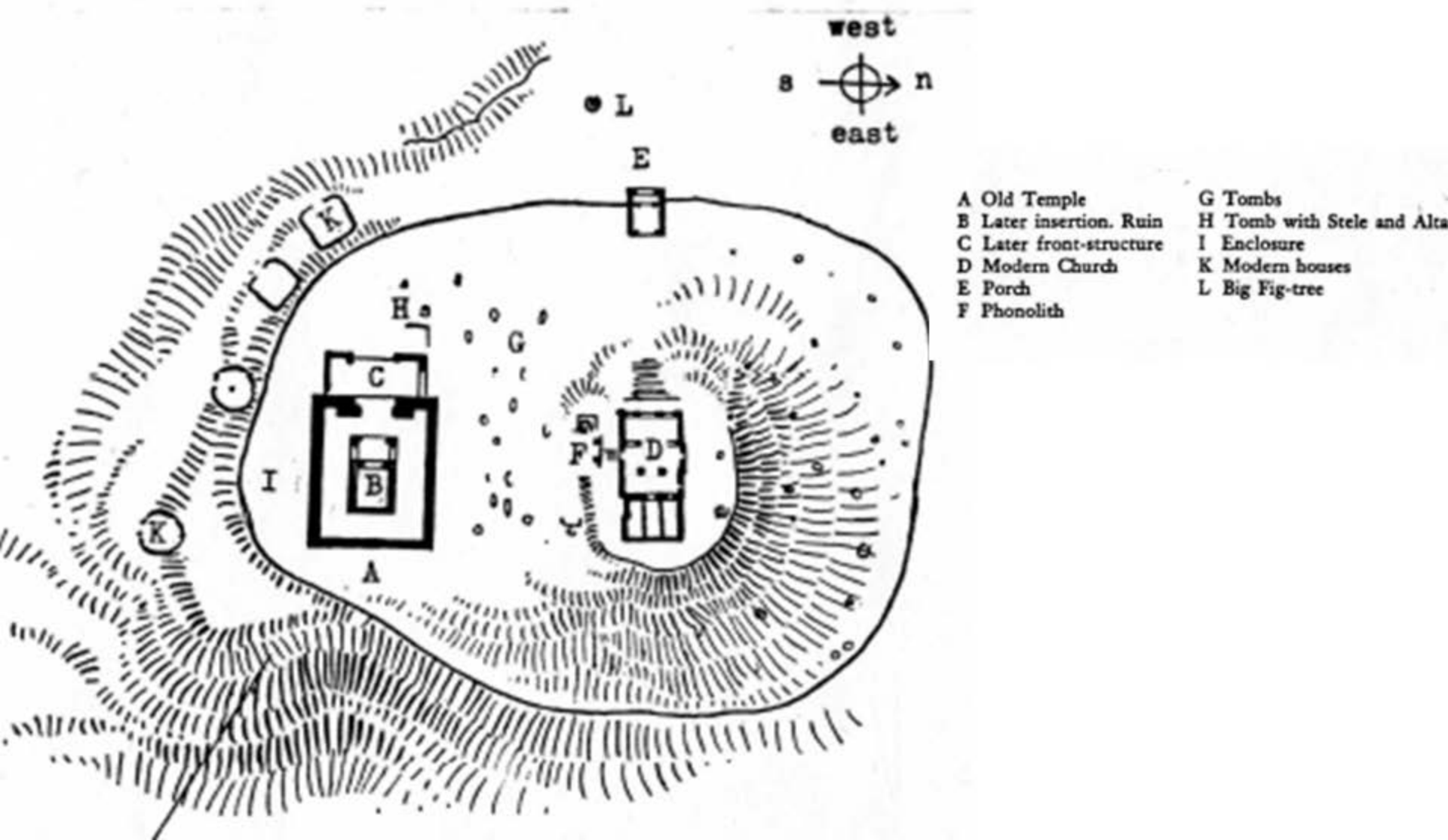


Character of Sabean script
which was usually cut by
a chisel into stone:
essentially straight lines
and circles or parts of
circles; many verticals

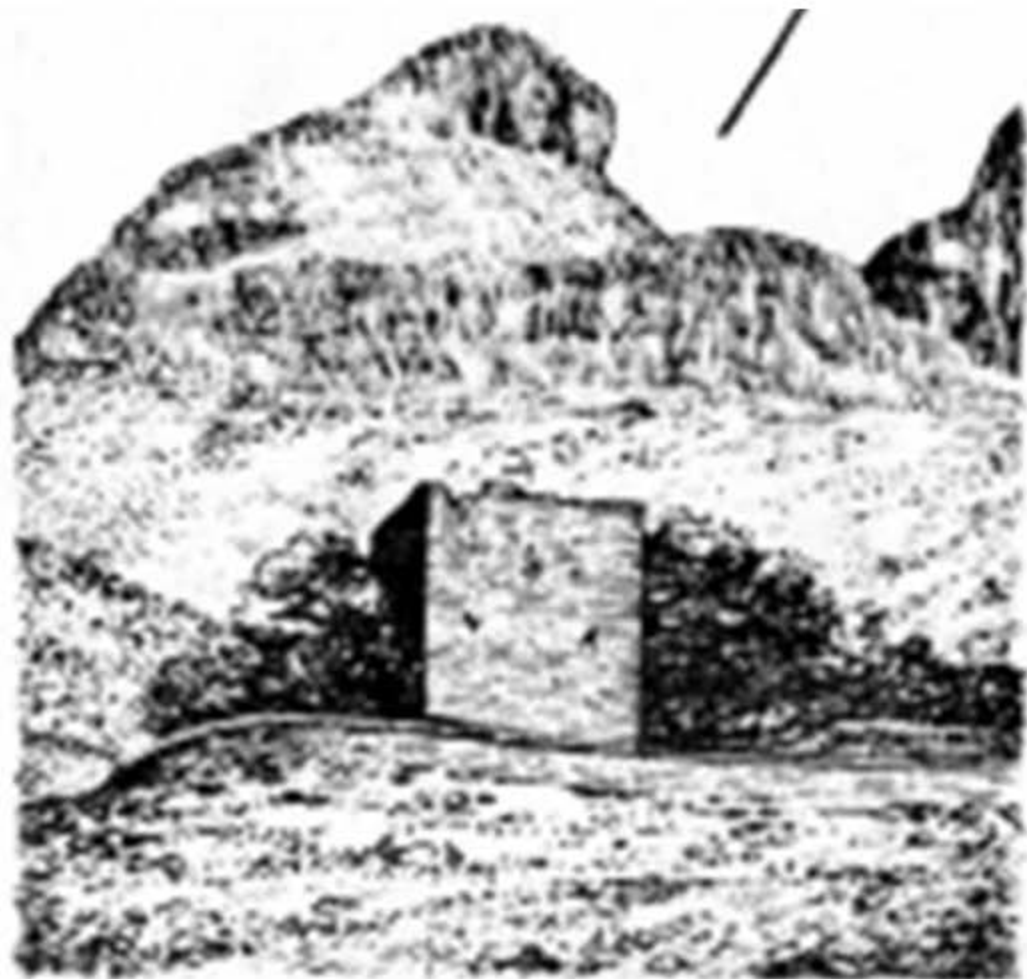


Character of Geez script
which was usually written
with a blunt reed pen:
essentially broad down-strokes
and narrow side-strokes always
in direction towards the right

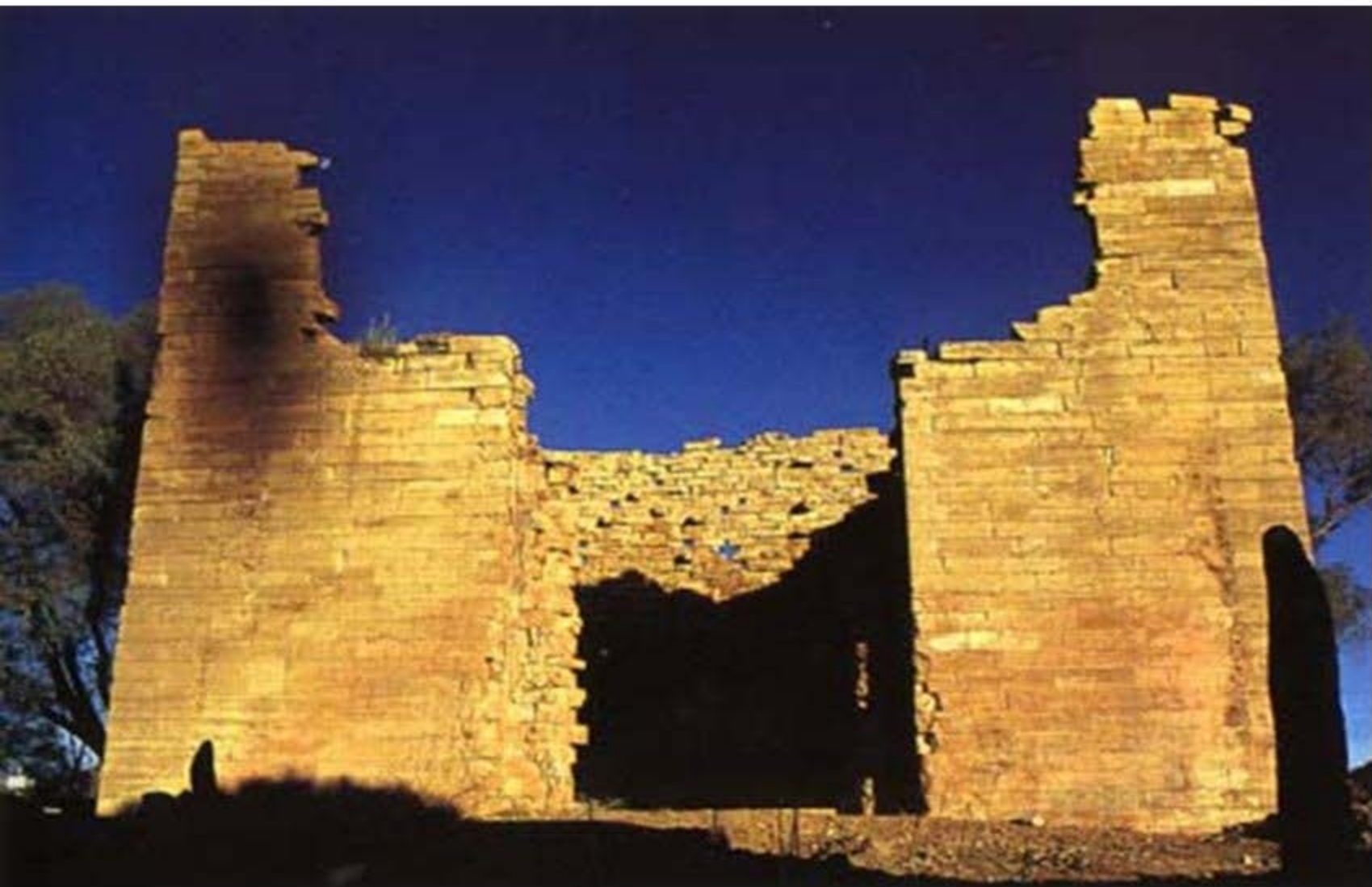
Temple of Yeha- the oldest preserved building in Ethiopia



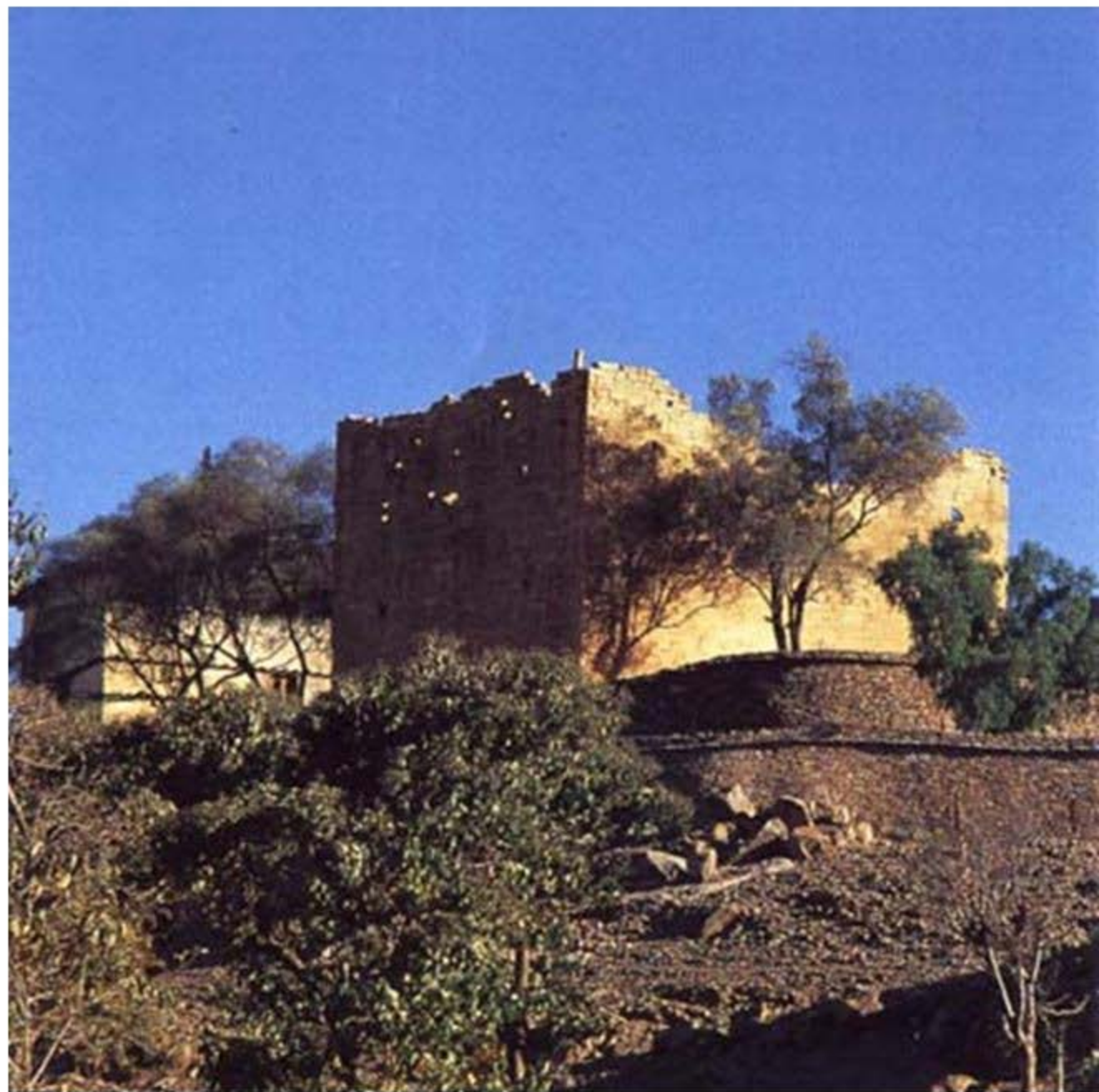
Temple of Yeha- the oldest preserved building in Ethiopia



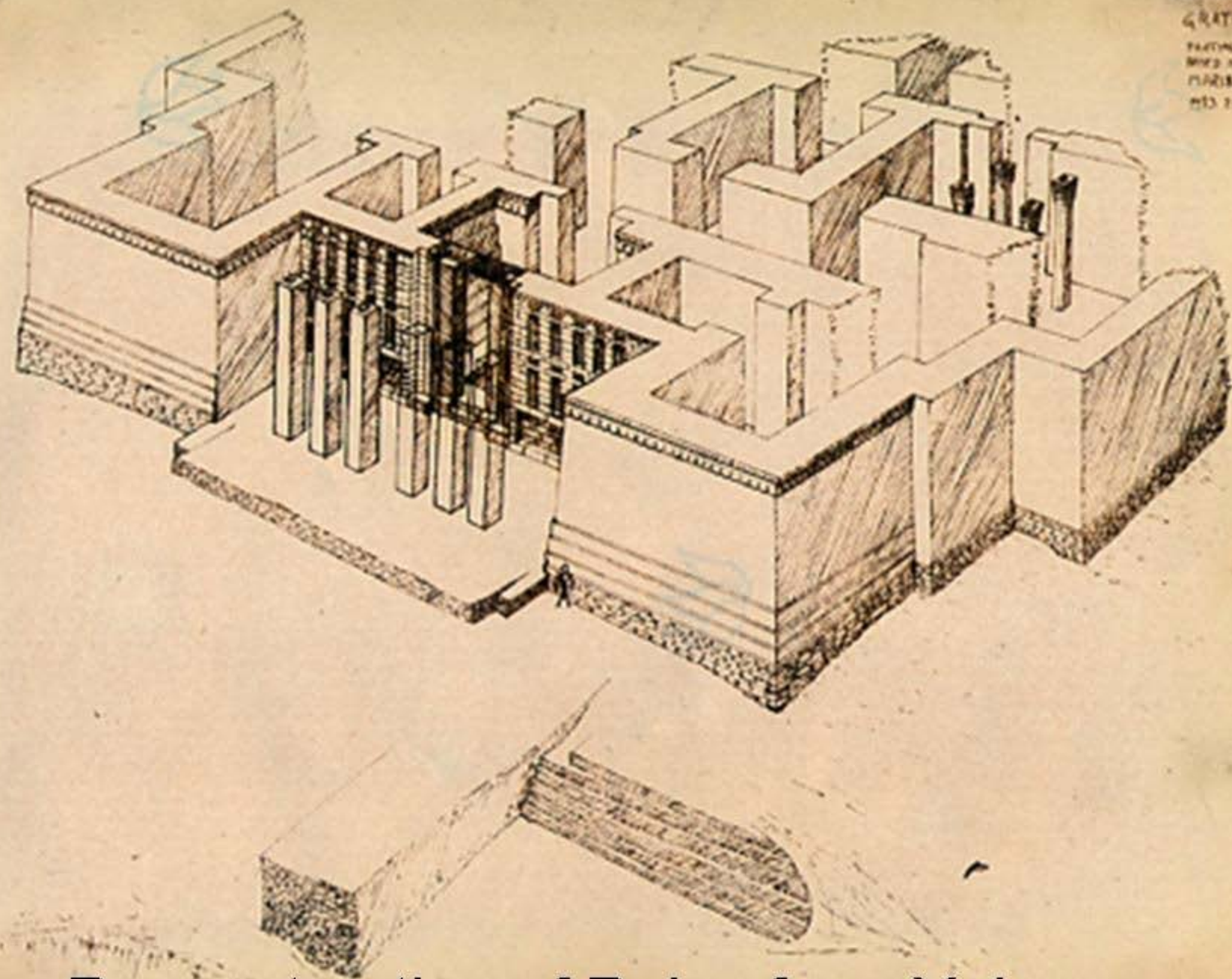
An Example from Yeha



Ruins from Yeha



YEHA
GRAT-SAW-GHAT
PARTIAL RECONSTRUCTION
BASED ON EXCAVATION
PLANS YEHA 1901
AND
RECONSTRUCTION
27.1.75



Reconstruction of Ruins from Yeha

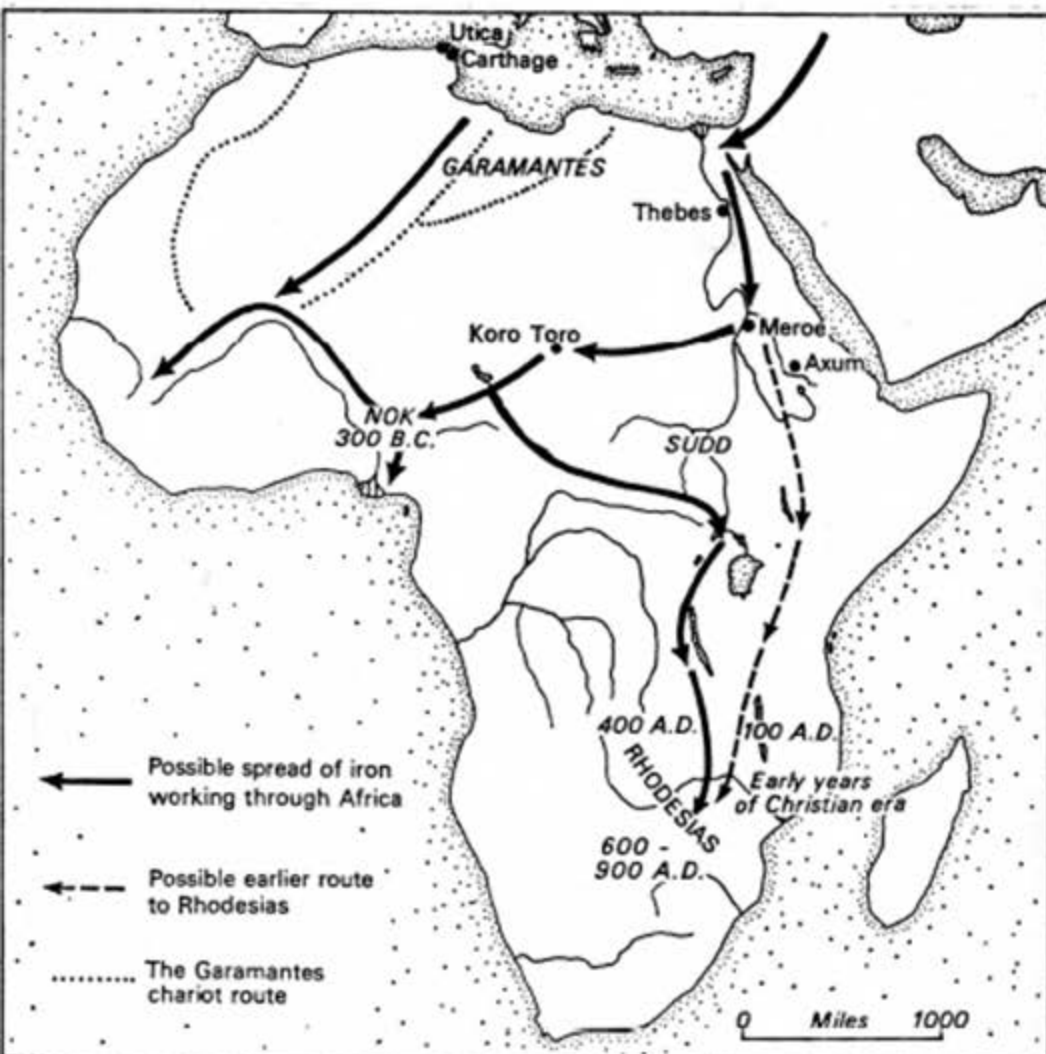
Wall detail from Yeha



Temple of Yeha- the oldest preserved building in Ethiopia

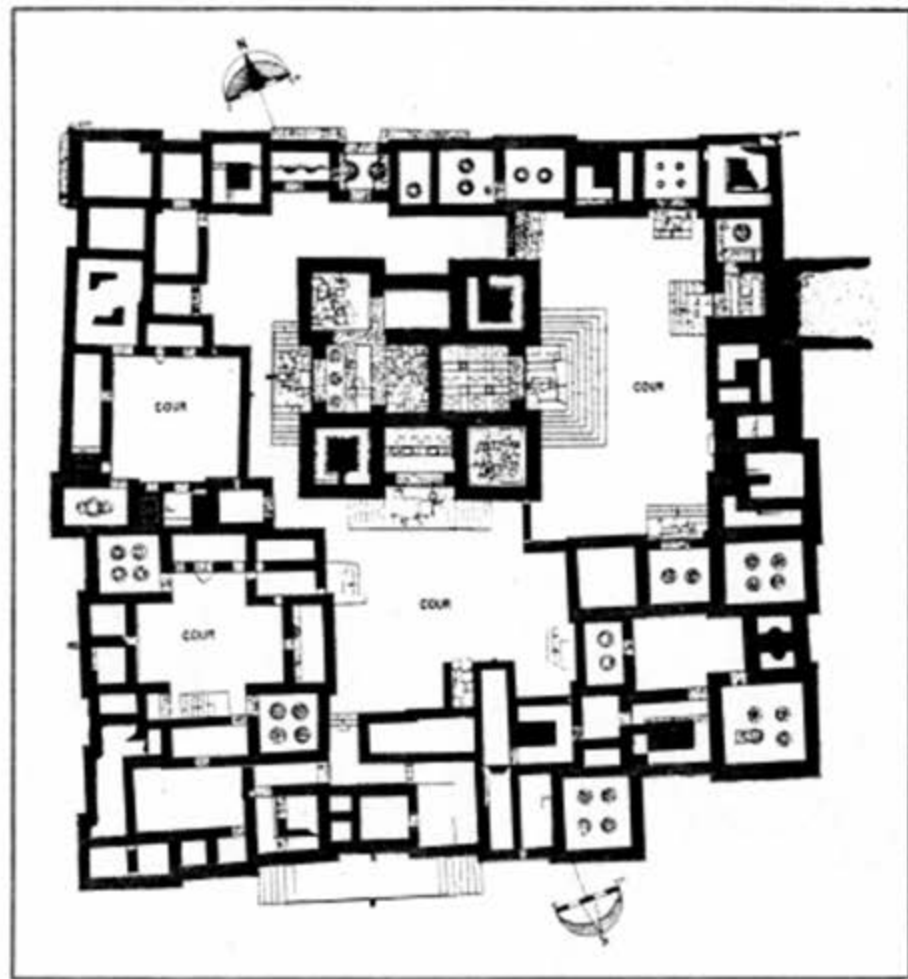
- Masonary of dressed stone
- The walls are smooth, with long well-cut blocks & excellent straightness & tightness of joints
- Courses are equal & one feet high
- The wall consists of an outer & an inner leaf so the short ends of through-going binders (like the headers in brick bond)

Intermediate period- Iron became known



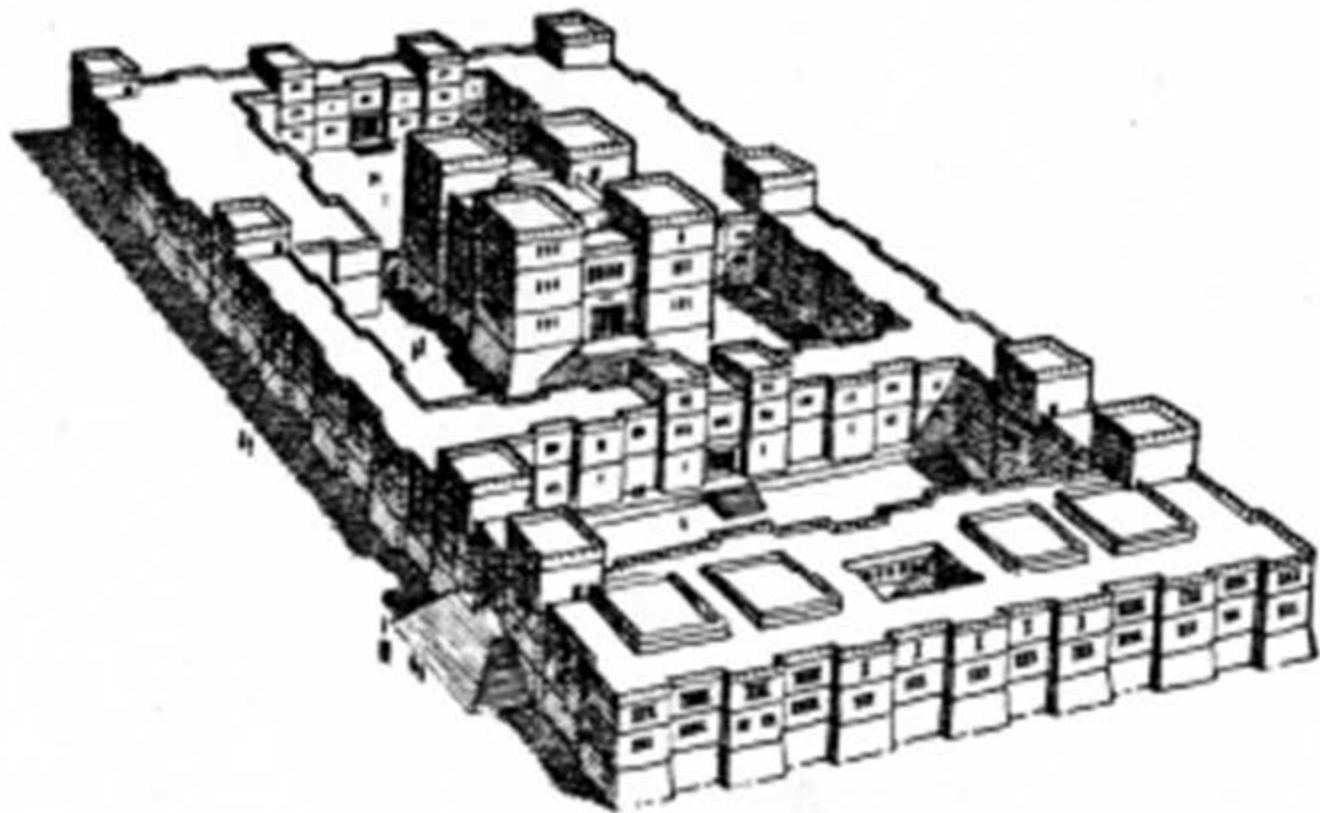
The spread of iron-working in Africa

The powerful kingdom of Axum 100 AD-1000AD



1. Plan of a palace recently excavated at Aksum

The powerful kindgom of Axum 100 AD-1000AD



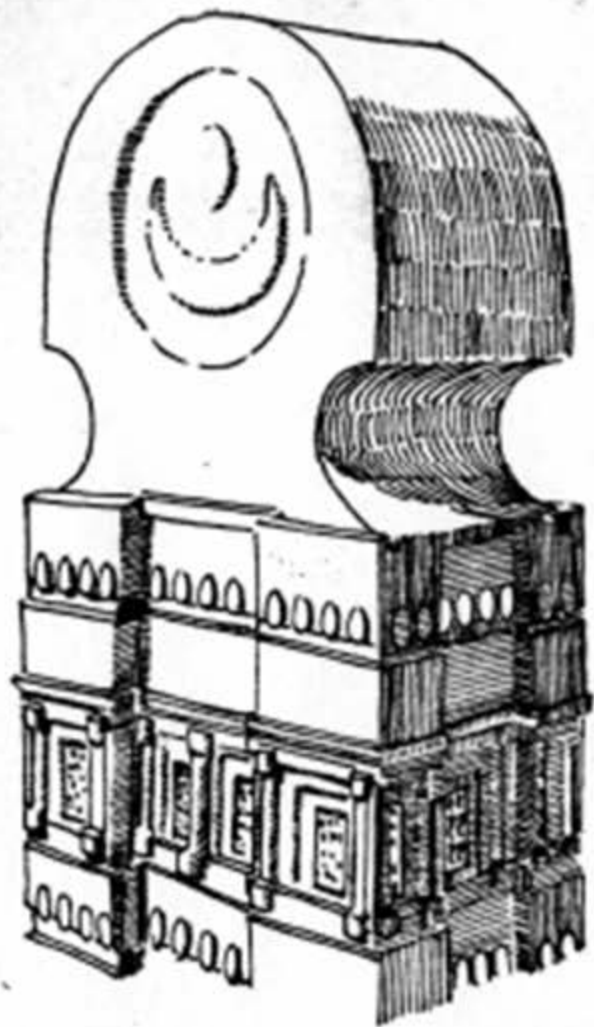
2. Reconstructed view of one of the largest palaces at Aksum (called King Taakha Maryan's)

Axumite Construction Technique

- Decorations of the largest steles at Aksum symbolize building structures
- But not with the assumption that the Axumites in reality constructed large no of storyes



Left: Even a simple one-storey building is in one case depicted on a stele from Aksum. This particular stele is $8\frac{1}{2}$ m high, while the giant ones are 20-30 metres, plus a couple of metres buried below ground for stability.



Above:

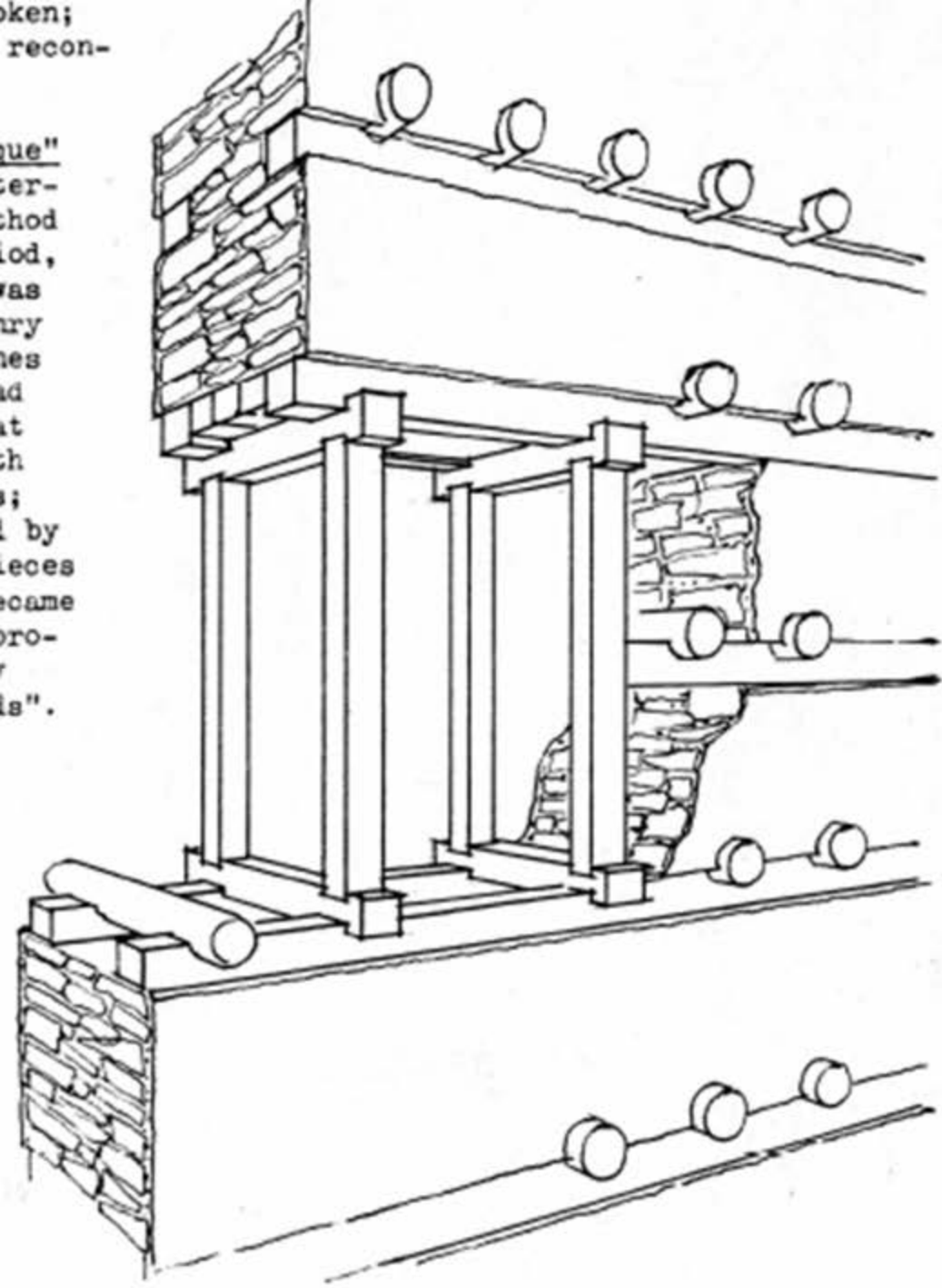
The summit of ancient
engineering skill -
top of the largest
stele at Aksum (now
fallen and broken;
the view is a recon-
structed one)

Monkey Head Construction Technique

It is a stone-&- clay masonry
Of rather small stones so that the
Walls had to be strengthened at
Narrow intervals with long squatered
Timbers; these were then held by short
Round cross- pieces the ends of
Which became visible as rows of
Which became visible as rows of
Protruding & smoothly rounded "monkey
Heads"

broken;
recon-

que"
ter-
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Axumite Construction Technique

Aksumite window and door frames were made of timbers cut into each other, with no nails but with shallow recesses and projections (hidden, not seen in this drawing) which acted as a sort of dowels.

Axumite window & door frames
Were made of timbers cut into each other
With no nailes but with shallow recesses & Projections which acted as a sort of dowels

From Sabean to Christian



Pre-Christian coin with
the king's name 'Ouzanas'
written in Greek letters



King Ezana of Aksum on his early coins used the symbol of the Sabeian religion - disk and crescent at the top of the coin

After Ezana's conversion to Christianity, the symbol of the cross was introduced - "Greek" form of the cross with all four arms equally long

front
side:

ጠሐይ ሥላሴ ኃይለማርያም

reverse
side:

ጸሐይ ግብር ግብር ግብር

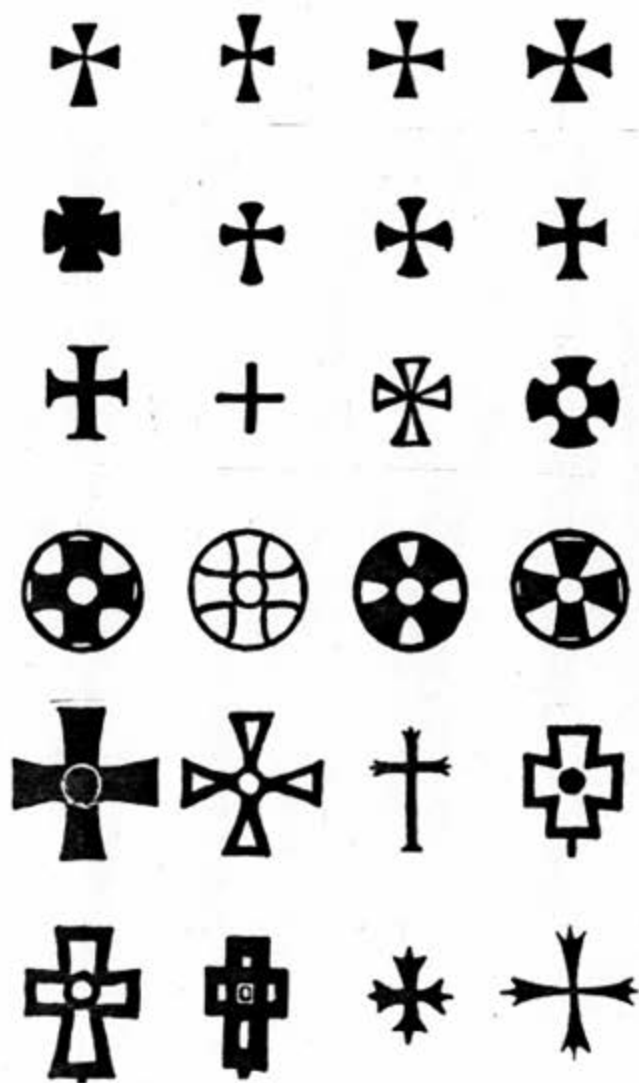
Above: Inscription on bronze coin from Christian time. Coin of King Mehadeyis ("the Reborn", a typically Christian name) approx. 400 A.D.

Below: Bronze coin of Emperor Armah, approximately 650 A.D. Drawing much enlarged - the coin has a diameter of about 20 mm and many Aksumite coins are smaller.

The king apparently
sits on a throne or
chair made of wood



Early types of Ethiopian crosses



The shape of cross with all four parts of equal length was the dominating type in Ethiopia already in the earliest Christian time, rather than the Latin cross with the downward part clearly longer than the other three parts.

Adulis Port of the Axumite Kindgom (0-800 AD)

Town of Adulis

Ville d'Adulis



Chemins conduisant d'Adulis à Aksum.

Soldier

Ethiopian combattant à pied.

Trône de Ptolémée.

Stone throne at Adulis

Αναμνηστικὸν

LES DESSINS DE COSMAS INDICOPLEUSTE

d'après la reproduction de MAC CRINDLE dans *The Christian Topography of Cosmas.*

Adulis Port of the Axumite Kingdom (0-800 AD)



Adulis Port of the Axumite Kingdom (0-800 AD)

Two written eyewitness accounts of Adulis by foreign visitors have been preserved to our days:

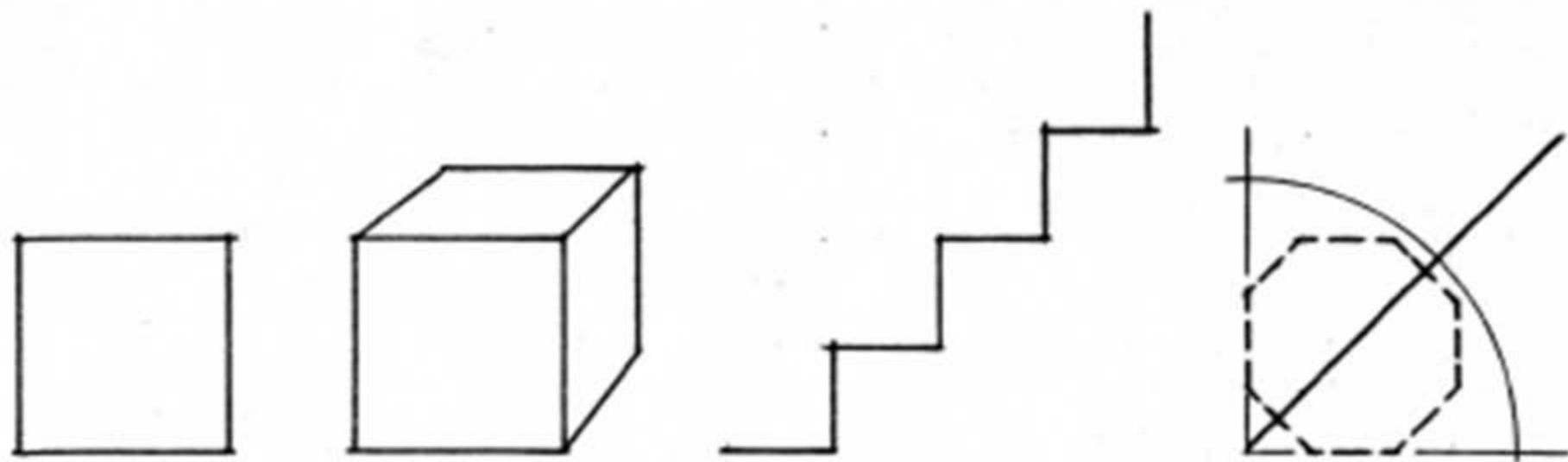
"Periplus of the Erythrean Sea" from about 50-100 A.D. and, almost five hundred years later, the "Christian Topography" by Cosmas who visited Adulis around 524 A.D.

The sketches above are redrawn in modern technique from the drawings of Cosmas.

The thrones below are reconstructions based on remains found at the site of Adulis.



Proportions in the Axumite Architecture



Principle of “equal-equal” generates the square,
the cube & the 45 degree angle
As well as octagonal shapes.

Proportions in the Axumite Architecture



This method of "equal-equal" can also be applied for repeated division "middle-middle-middle" which produces the number series

1,2,4,8,16,32,-----

Proportions in the Axumite Architecture

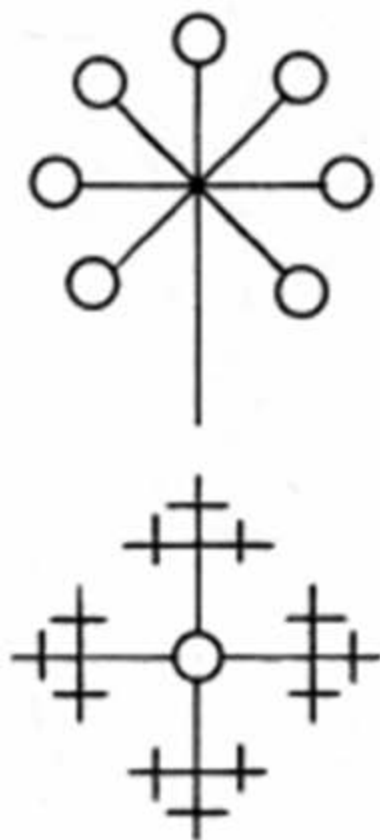
1 2 4 8 16 32

for columns in a row, or rather for the spaces left between them, and for subdivisions of angles as in Ethiopian types of many-armed cross designs or for subdivisions of subdivisions of an ornamental theme, usually without particularly emphasizing "the one in the centre" and often not hesitating to place a pillar instead of an opening on the symmetry line:



AKSUMITE/ETHIOPIAN

MEDITERRANEAN ETC.



Proportions in the Axumite Architecture

"equidimensional" of the old Ethiopian tradition as different from "central-symmetrical" of e.g. the Byzantine tradition; sometimes the two may be mixed in medieval Ethiopian church architecture

There are some indications that the Sabeo-Aksumite structures (like e.g. Pharaonic Egyptian ones) were measured by a 10-system of counting rather than a 12-system.

Pre-Christian "magic numbers", if any at all, may have been prime numbers like 7 and 11.

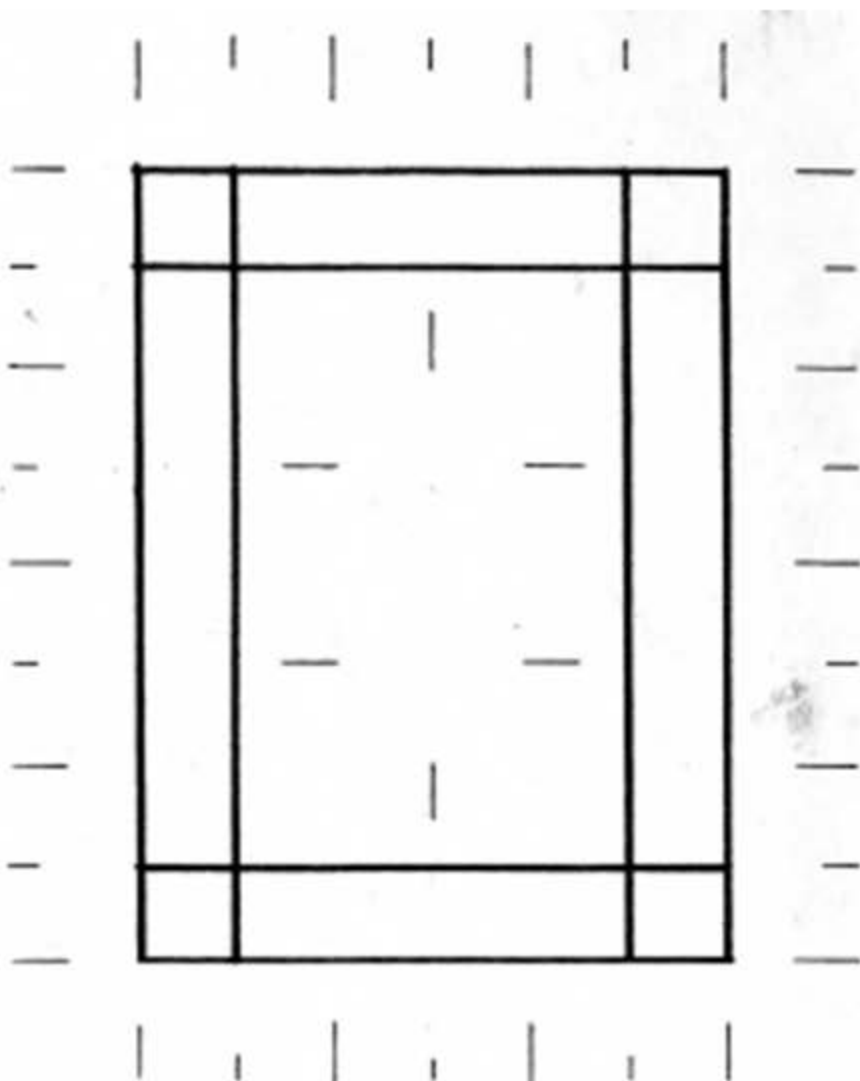


Proportions in the Axumite Architecture

Proportioning in old Ethiopian architecture was not by "the golden section" or any similarly complicated geometrical procedure but by straightforward arithmetical counting of numbers and units.

The proportion of the window drawn here as an example could with equal right be called to be 2:3 or 3:4 depending on whether one chooses to consider the inner or outer line of the frame.

Diagonals through corners would not be conceived as the carriers of proportions throughout a composition (as they sometimes were e.g. in the Renaissance and other periods of Western architecture)



Proportions in the Axumite Architecture

The view below of an Aksumite palace is a reconstruction made by the German archaeological expedition to Ethiopia before World War I, Deutsche Aksum Expedition.

The lower parts of the view are based on excavated remains. Note that there was no timber and no "monkey heads" near the ground (compare next page for type of masonry at the bottom of walls). The upper parts of the view are not necessarily correct in all details but indicate the general character of Aksumite architecture. The roof is more or less a guess.

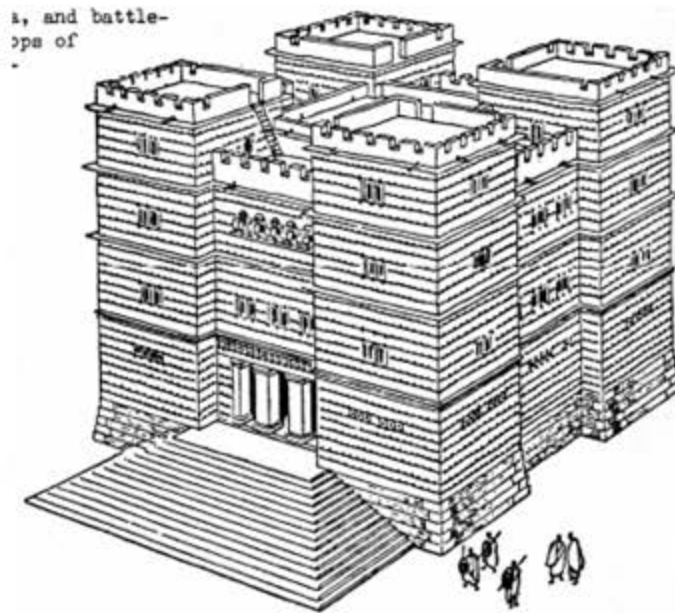
Proportions in the Axumite Architecture

but flat roofs were common in northern Ethiopia, and battlements for wall tops of castles were constructed in various parts of the world already before Aksumite time.



Proportions in the Axumite Architecture

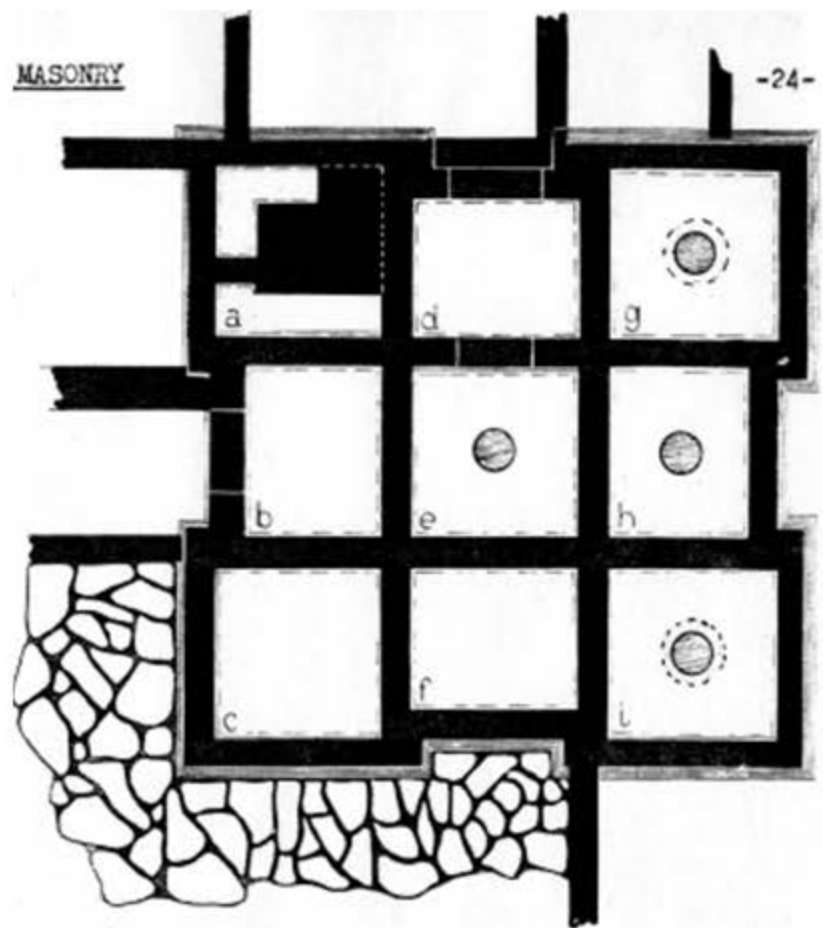
It has not been proved which was the actually occurring largest number of storeys in Aksumite palaces.



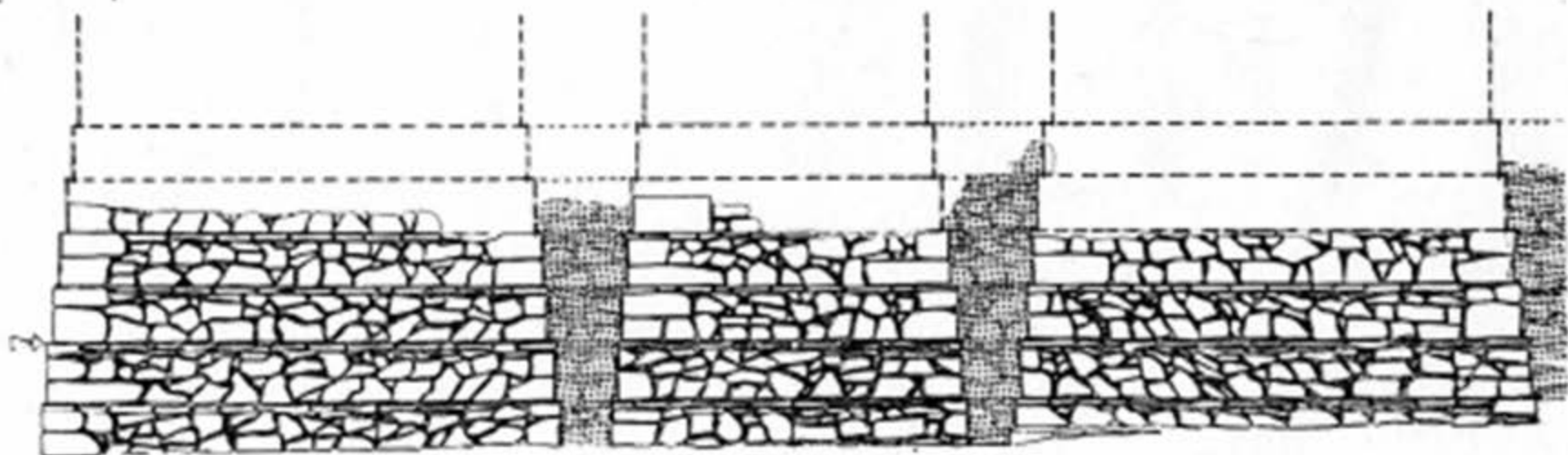
Axumite Dry Stone Construction

Plan of the "Central Building C" excavated recently at Matara near Senafe in Eritrea.

Walls of such structures (at least the lower parts) were made in the same technique at all Aksumite sites, from the Red Sea port of Adulis to the high-land capital city of Aksum.



Axumite Dry Stone Construction



Views of stone walls from Matara (the views would be almost identical for structures from Adulis or Aksum).

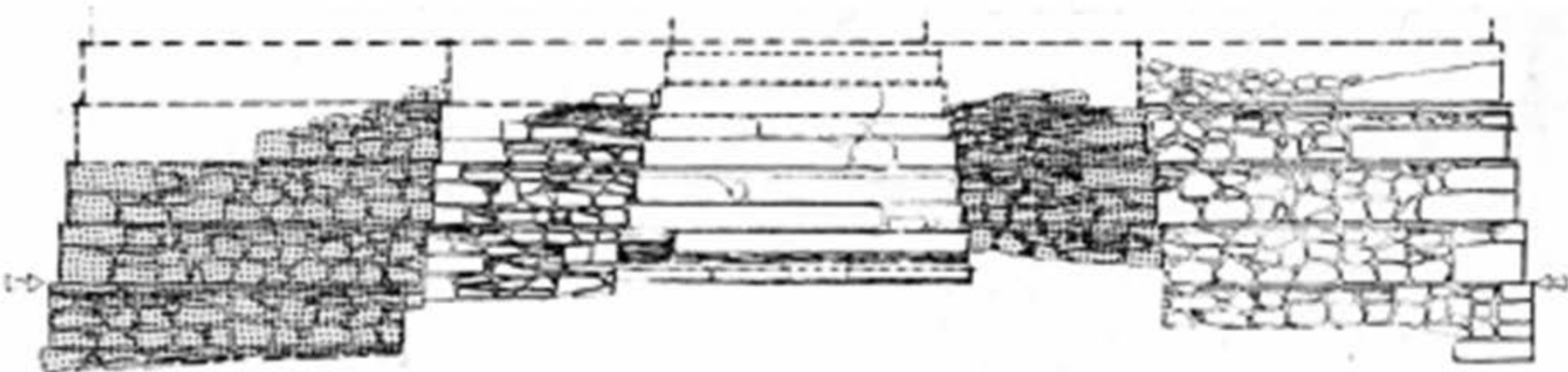
Axumite Dry Stone Construction

The views show the typical technique of dry-stone masonry with

1- Large & squarely dressed stones at the corners

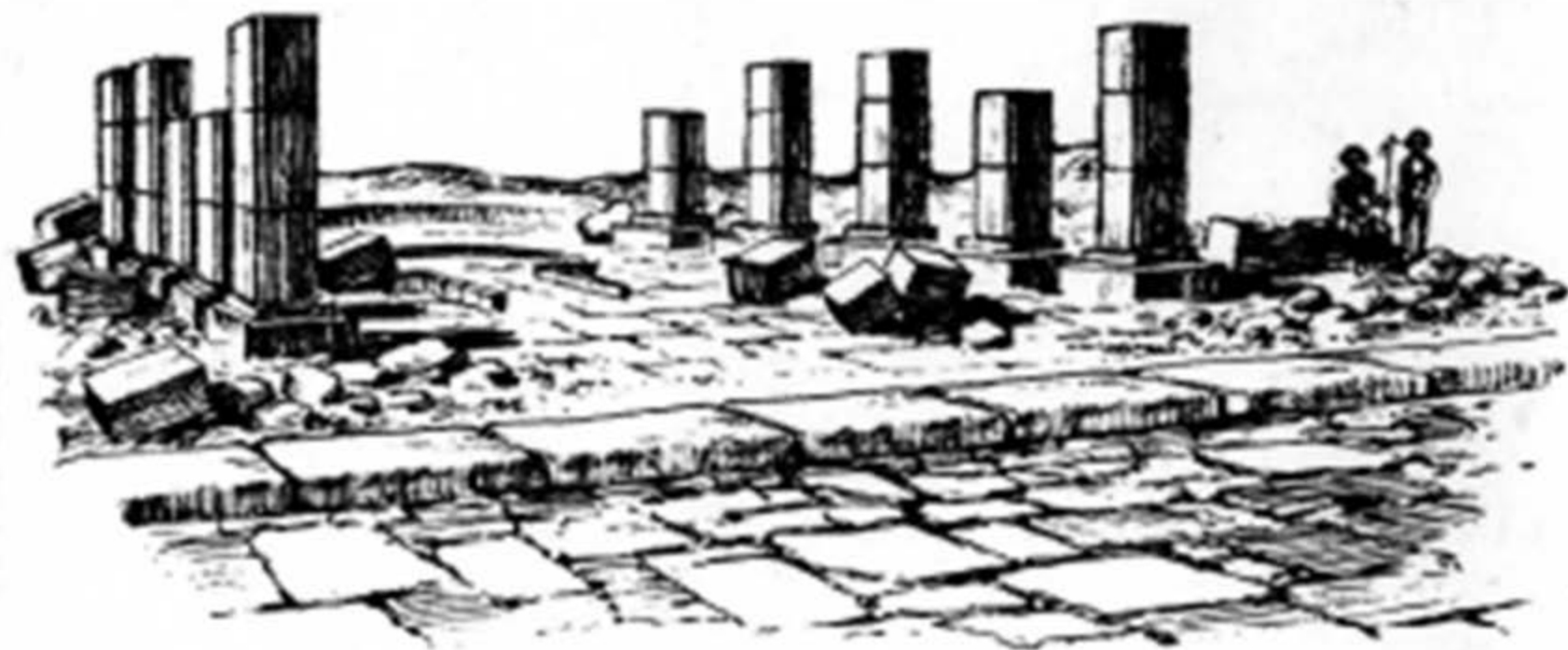
2- Small broken stones for the main bulk of walls

3- Slabs of schist or similar thin flat stones to cover the many narrow "shelves" which are formed b/c the walls are stepped inwards at regular intervals



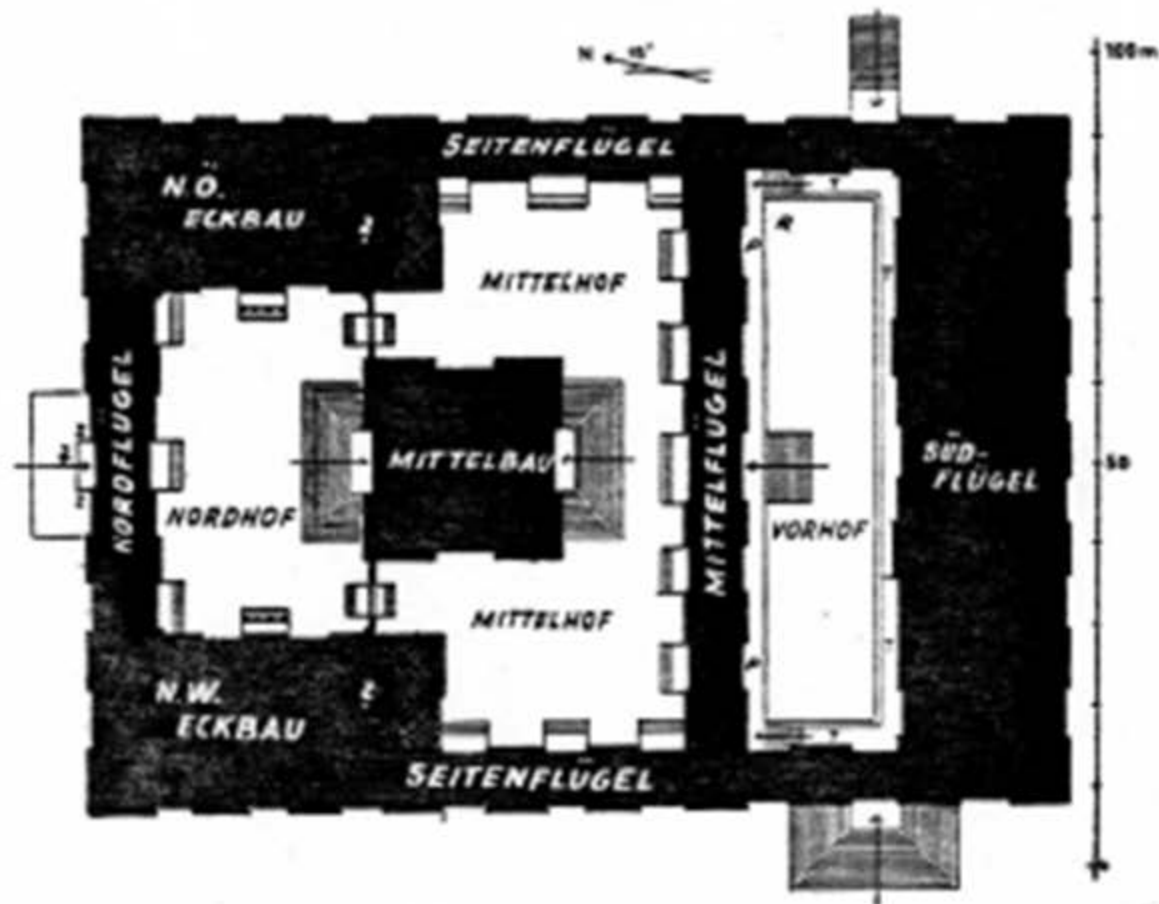
More Examples of Architecture from the Axumite Empire 100-1000 AD

100 A.D.



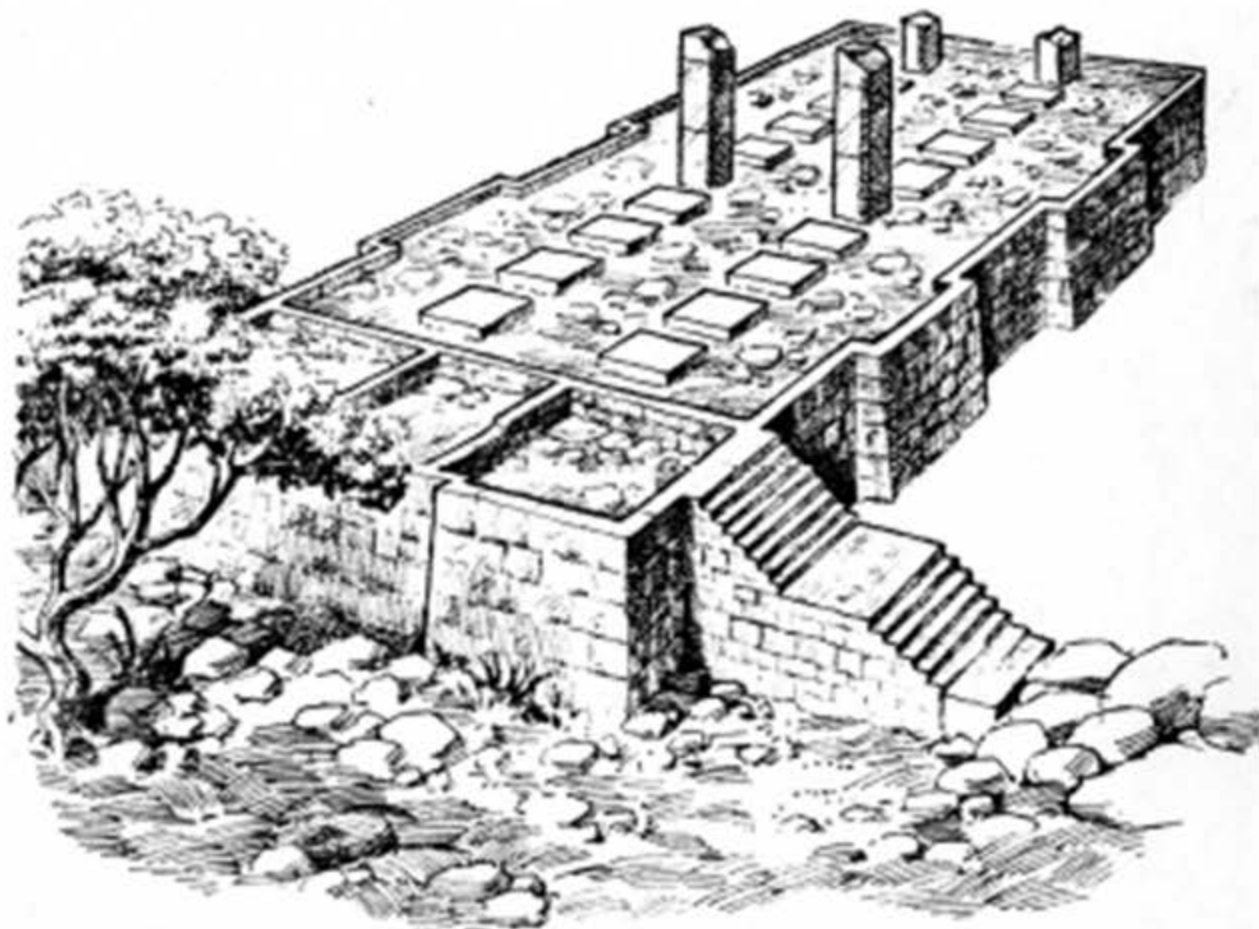
1. The port of Adulis - abandoned after the decline of Aksum

More Examples of Architecture from the Axumite Empire 100-1000 AD



2. Aksum - ground plan of Taakha Maryam Palace

More Examples of Architecture from the Axumite Empire 100-1000 AD

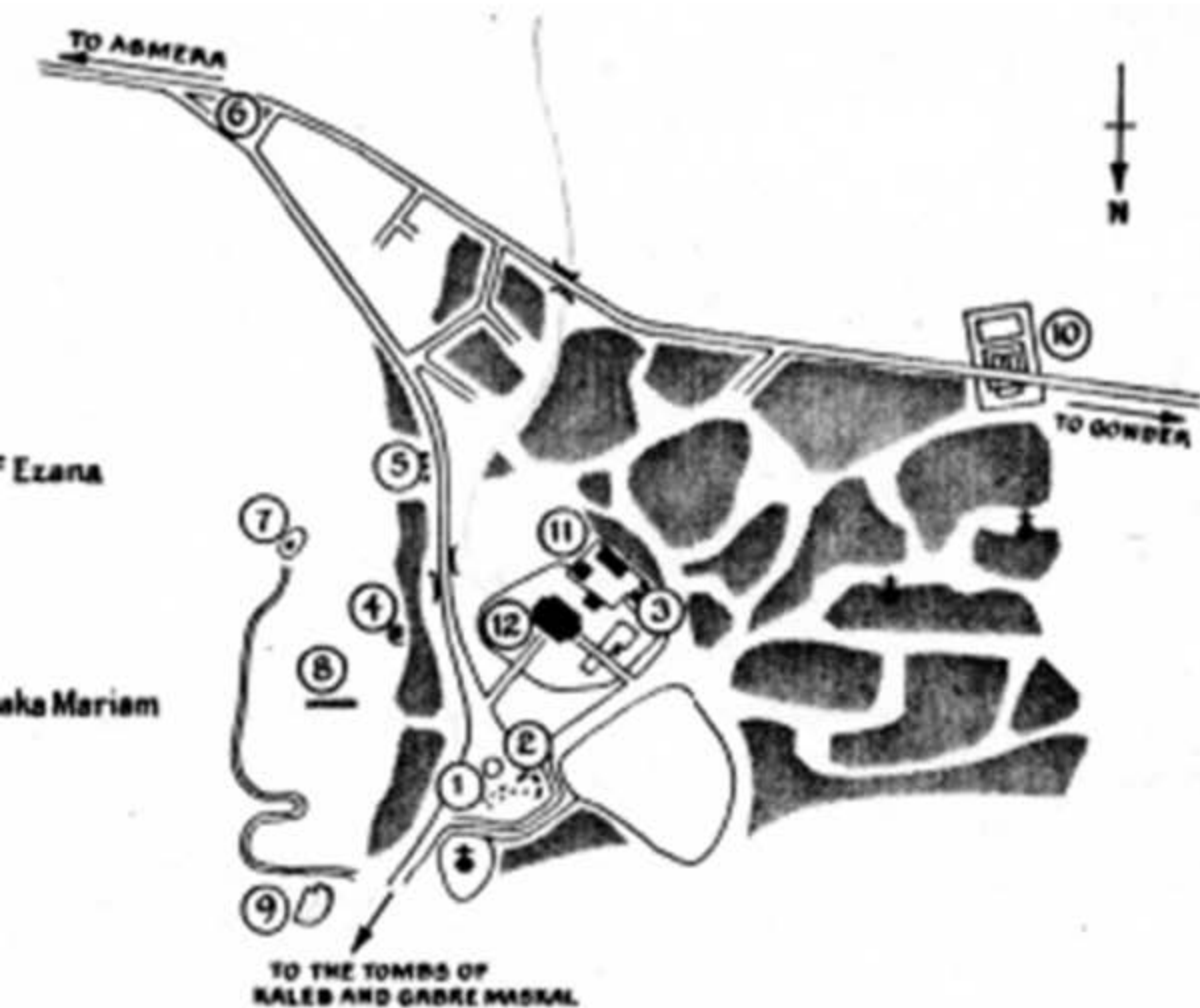


3. Ruins of an Aksumite temple at Agula

Axsum & Tourism

Ethiopia is unique in its part of Africa for having these sites with great architectural monuments from ancient times. No comparable places of architectural antiquities are found in the other East African countries.

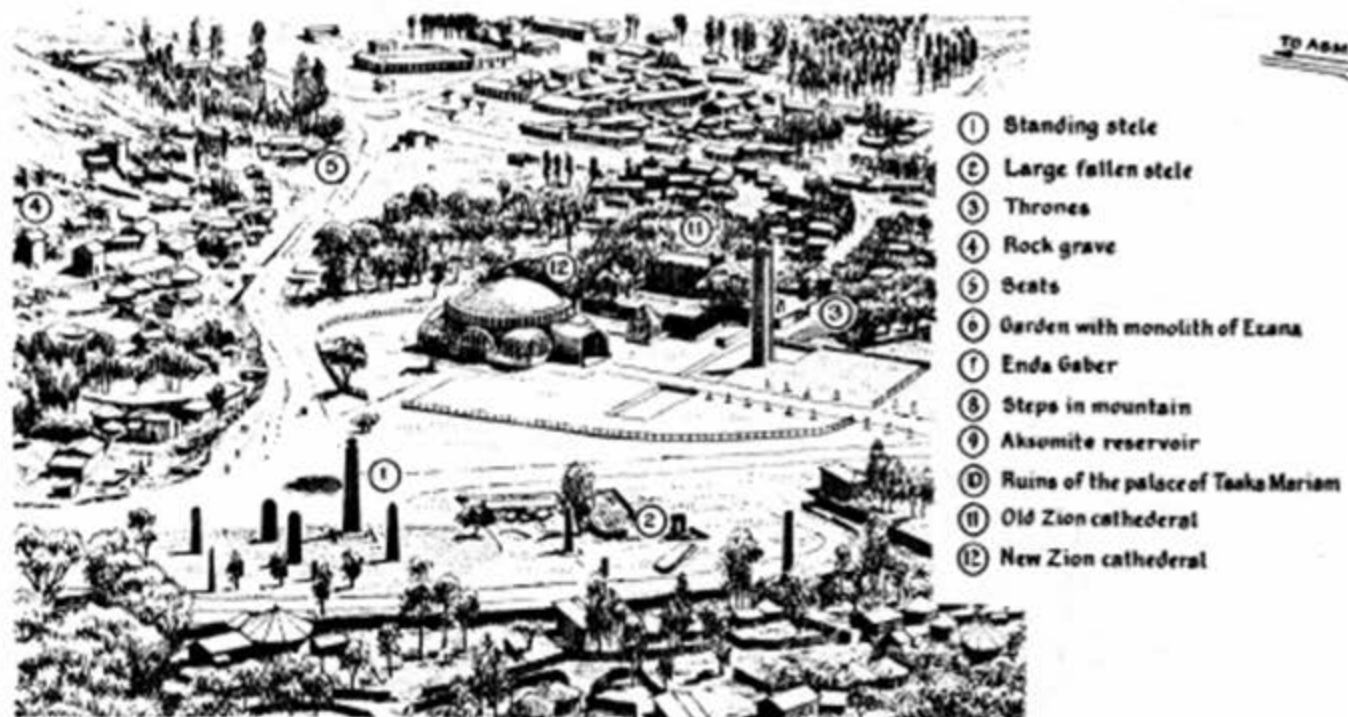
Axsum & Tourism



Axsum & Tourism

Nowadays the historical sites of Ethiopia, especially Aksum, Lalibela and Gondar, are being restored and adapted for "cultural tourism" to attract visitors.

Ethiopia is having the monuments places of in the oth



Early Christian Tombs

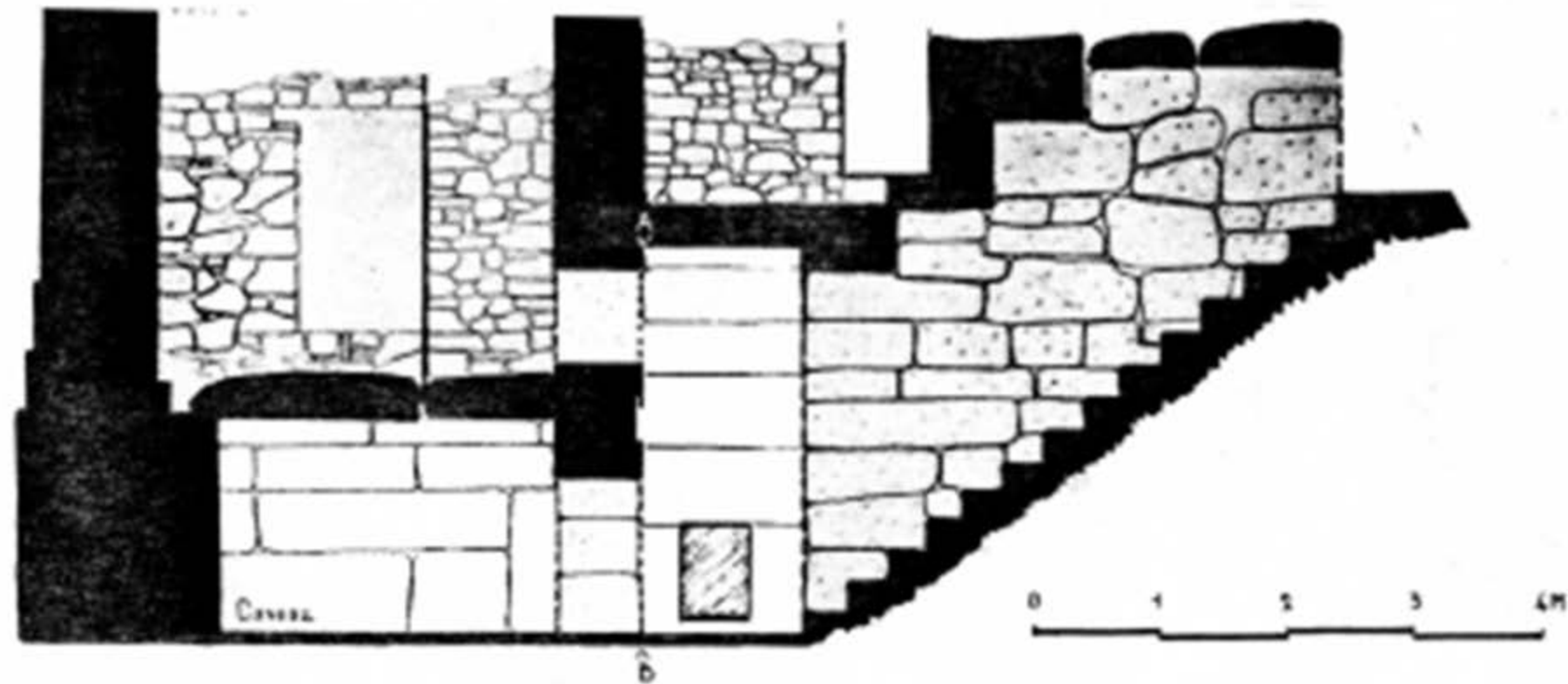
Subterranean tombs of kings are not only dramatic places to visit as a tourist, but in the case of Aksumite structures they are also very impressive from a builder's point of view, because of the huge stone blocks that were used for such tombs.

Early Christian Tombs



Right: ELEVATION with the Christian cross over the entrance

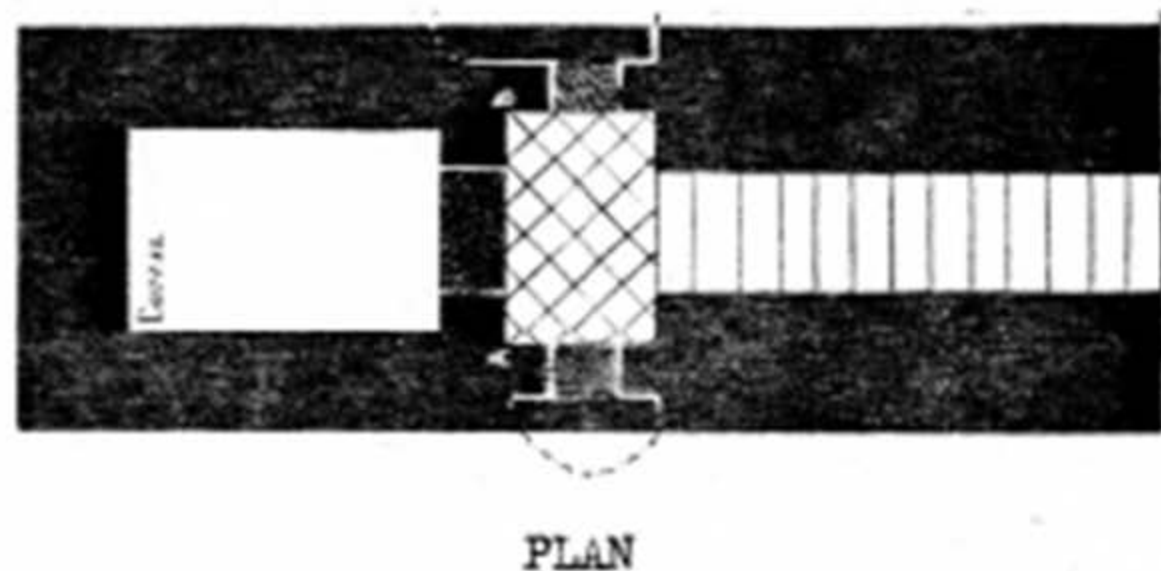
Early Christian Tombs



Matara D. Plan, élévation et coupe du tombeau.

Early Christian Tombs

Longitudinal SECTION of the same tomb as above, at Matara



(The three drawings are all to different scales)

Early Christian Tombs 2

The so-called "Tomb of Kaleb" and "Tomb of Gebre Meskel" are subterranean structures of huge stone blocks in a plateau above Aksum.

Early Christian Tombs 2

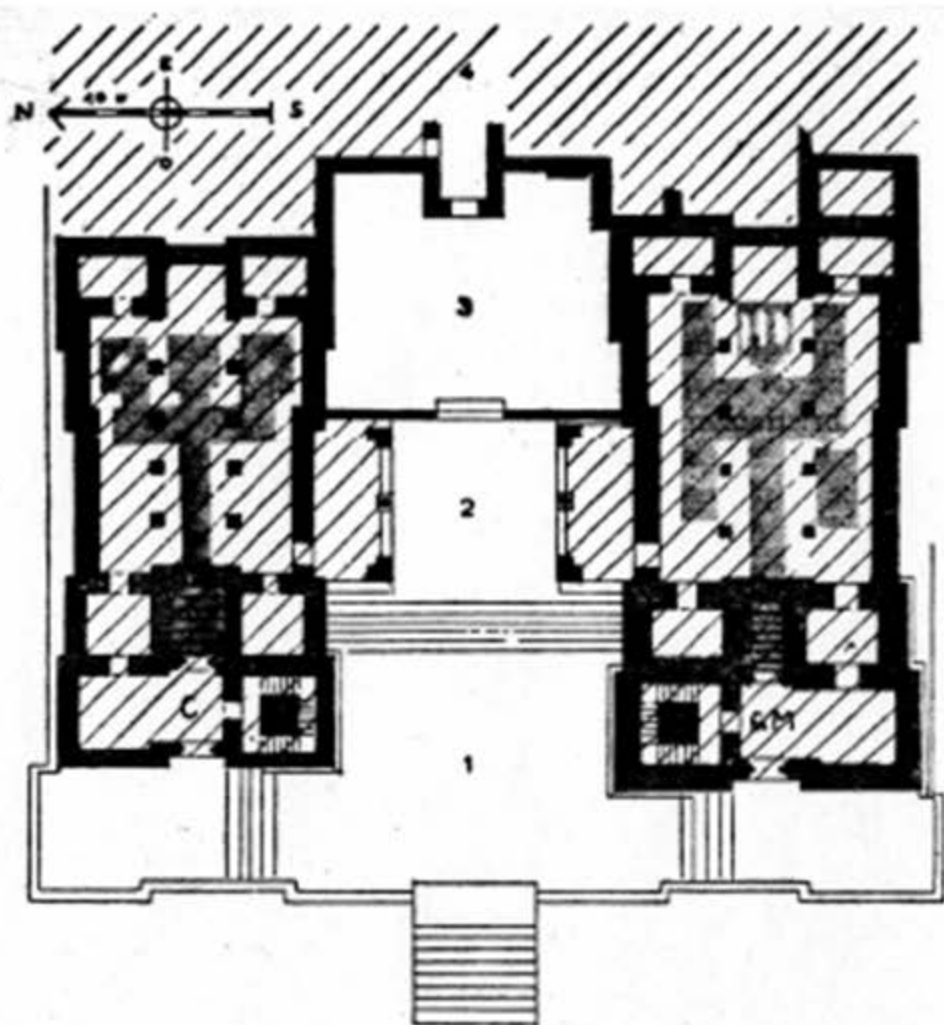


Fig. 29. — Axoum. — Plan (restitué) des deux églises dites « Tombeau de Caléb (= C) et de Gabra-Masqal » (= G M).



Above: Reconstructed plan which assumes that the structure contained a pair of "twin" churches

Early Christian Tombs 2

The building complex above these tombs contained an entrance terrace (1) flanked by two porticos (2) and with an inner courtyard (3).

The entrances to the upper complex as well as to the tombs are orientated towards the west, like in all properly orientated Ethiopian churches.

Only a few courses of masonry are now left above ground.

Behind (4) there are also ruins - of a monastery? - and some deep but narrow tombs were recently found and excavated.

- An entrance flanked by two porticos
- An inner courtyard
- Entrance oriented west- like Ethiopian Churches

Early Christian Tombs 2

The views show the “Tomb Of King Kaleb” which is Situated Under the right-hand portion of the above plan

