

Figure 1

432 CENTURIES OF RECORDED SCIENCE AND TECHNOLOGY IN BLACK AFRICA

AN INTRODUCTION TO THE HISTORY OF SCIENCE IN AFRICA

CHINWEIZU

Figure 2

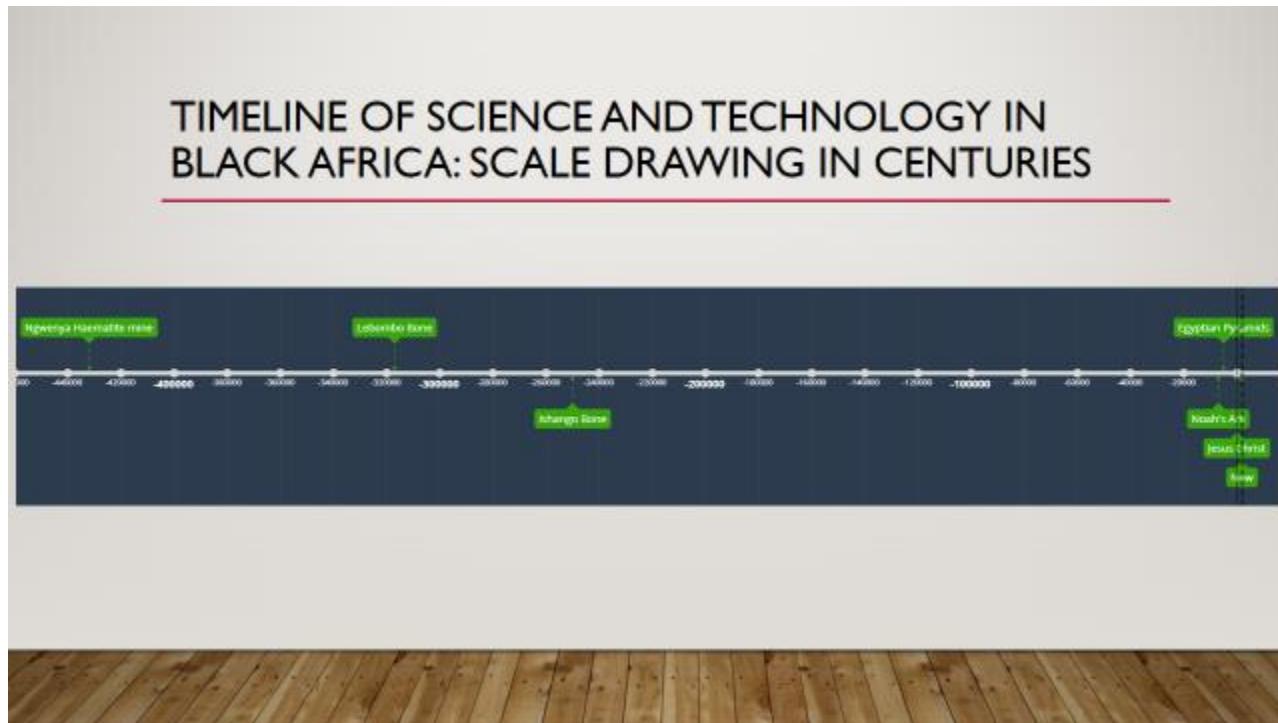


Figure 3-Map of Africa showing exhibit locations

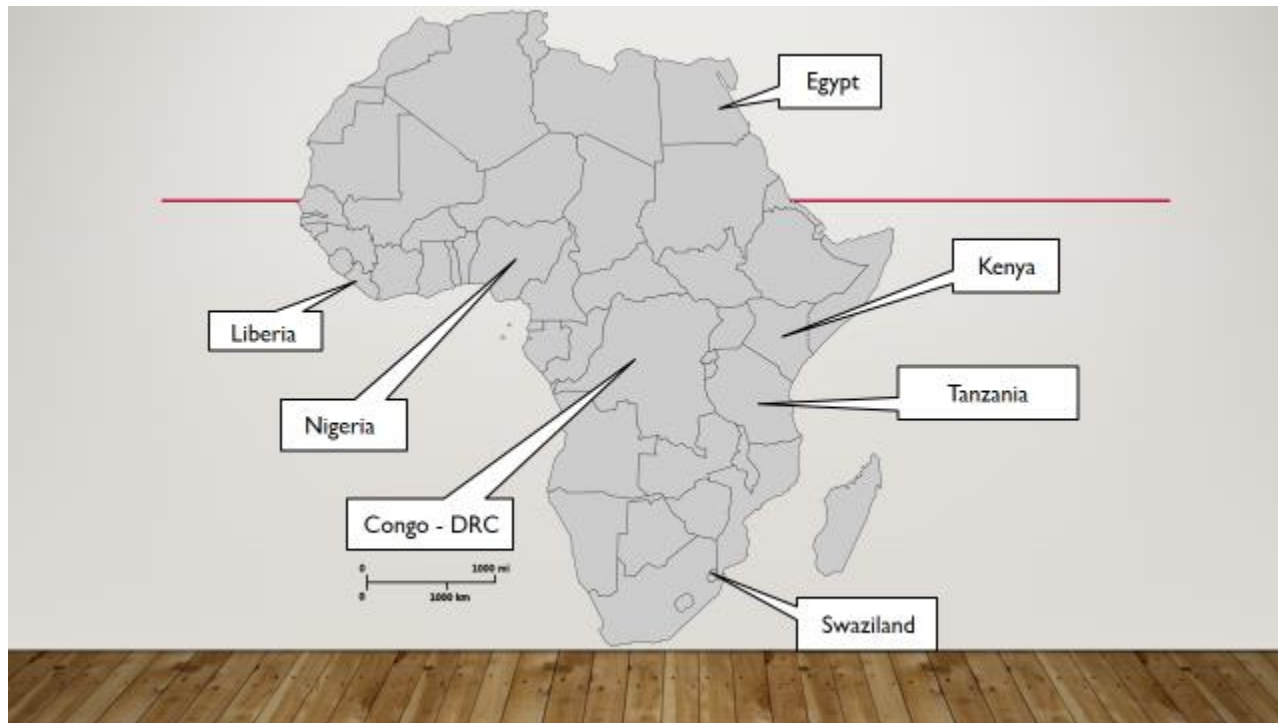


Figure 4-Ancient African Mining



Figure 5-Nsangwini Rock art-An example of rock art for which the red ochre was mined

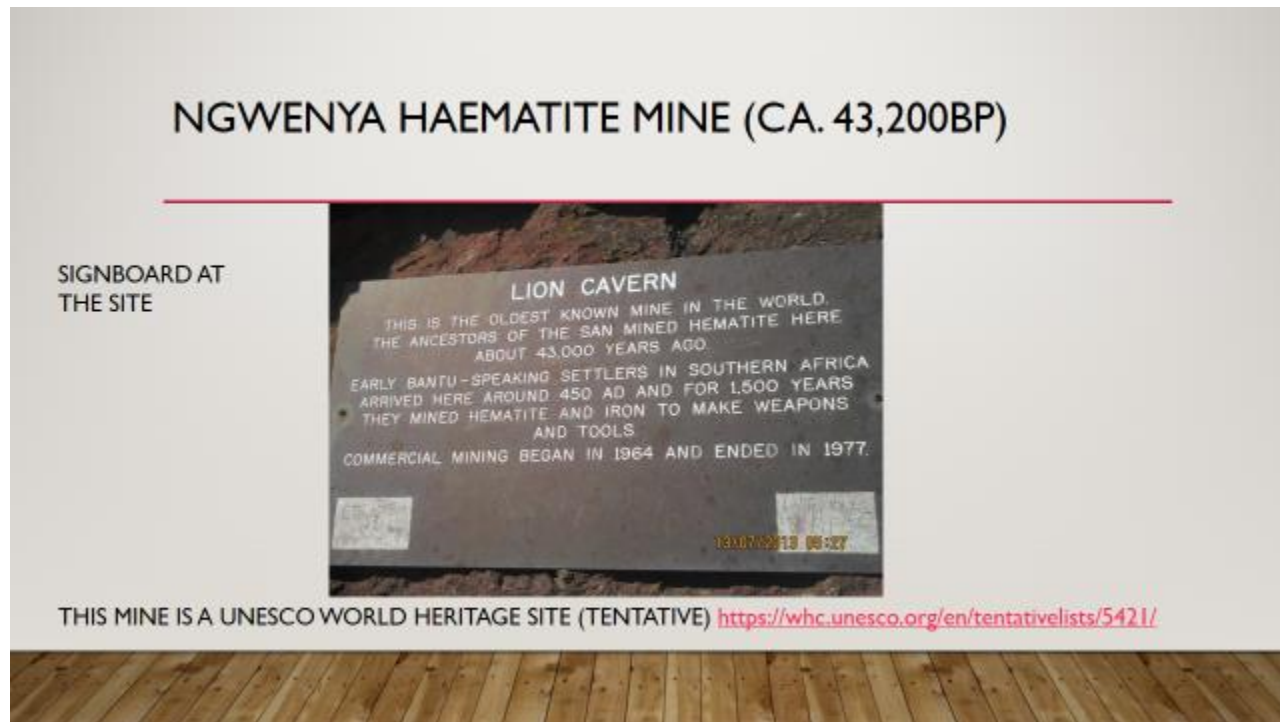


Figure 6-View of the mine face



Figure 7-View from inside the cave, looking out at the surrounding hills.



Figure 8-Nsangwini Rock art-An example of rock art for which the red ochre was mined

NSANGWINI ROCK ART



Nsangwini Rock art: An example of rock art for which the red ochre was mined

Figure 9-[Exhibit 2]



Figure 10-Slide 10 Lebombo bone ca. 35000BC (37000 BP)



Figure 11-Two Sides of Ishango bone

TWO SIDES OF THE ISHANGO BONE (CA. 25000
BC/27000 BP)

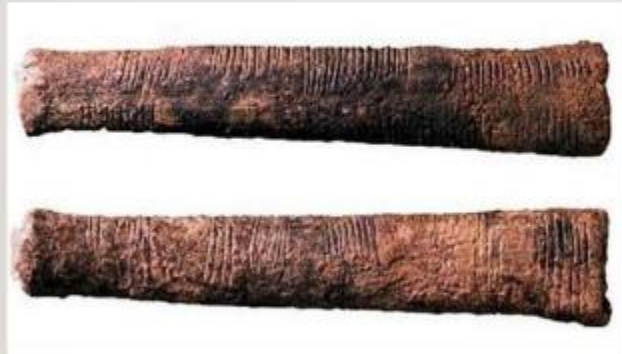


Figure 12-Ishango bone marks details

ISHANGO BONE MARKS

- Row (b) shows the prime numbers between 10 and 20, and is evidence of a knowledge of prime numbers in Ishango society. A prime number is a whole number greater than one that cannot be divided by any whole number (other than 1 and itself) to give another whole number.
- Row (c) The groups of marks (5, 5; 10), (4, 8), (3, 6) give evidence of a knowledge of multiplication and especially of doubling; we shall see the significance of doubling when we get to [Exhibit 4] Ancient Egyptian math.



Figure 13-Ishango bone marks showing enlarged details

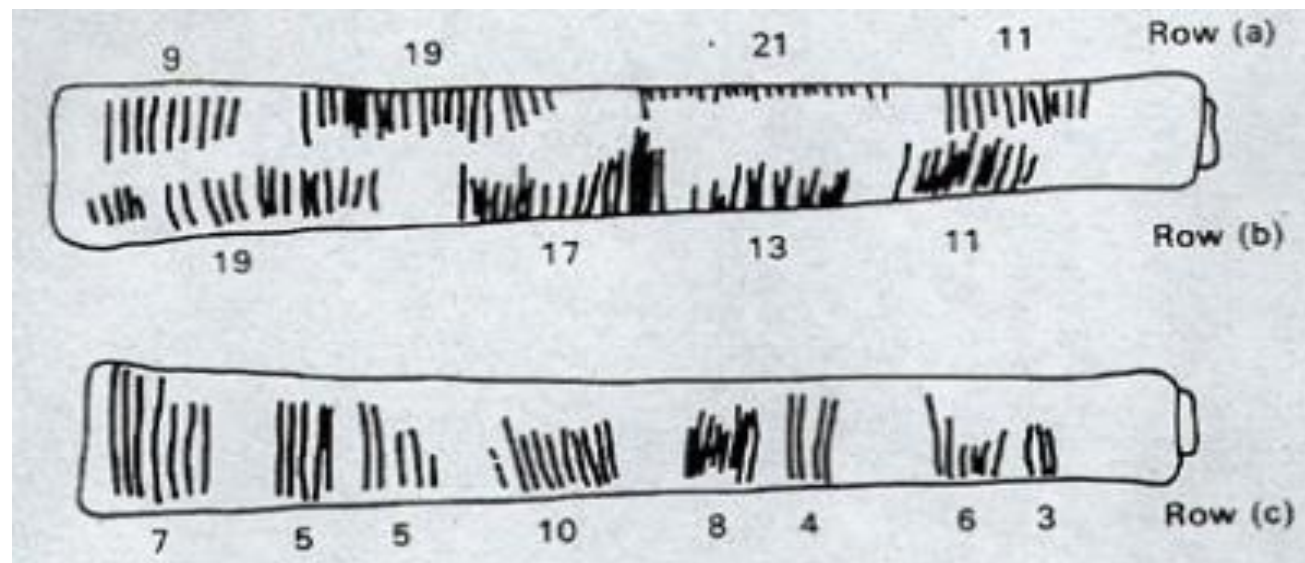


Figure 14- [Exhibit 3] Ancient Egyptian Science and Technology[Black Africa's Showcase]

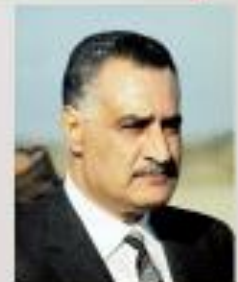


Figure 15-Painting from the tomb of Ramses III.

PAINTING FROM THE TOMB OF RAMSES III



ANWAR SADAT
3rd President of Egypt



GAMEL ABDEL
NASSER
2nd President of
Egypt

Lepsius, K.R. *Denkmöler Aus Ägypten Und Äthiopien. Ergänzungsband.* Edited by K. Sethe Berlin:Verlag. 1913., Plate 48.

- 1st on bottom right: tmh(w) 'Libyan(s)' (Gardiner 1957:601, Faulkner 1962:304)
 2nd from right: nhsw(w) 'Nubian(s)' (Gardiner 1957:575, 619, Faulkner 1962:137)
 3rd from right: 'am(w) 'Asiatic(s)' (Gardiner 1957:557, 606, Faulkner 1962:38)
 4th from right: mnt 'men, mankind; Egyptians (collective/mass noun)' (Gardiner 1957:578, 618, 620, Faulkner 1962:149-50)

Figure 16- Map of the Nile basin, from the Delta to the Great Lakes in Central Africa.

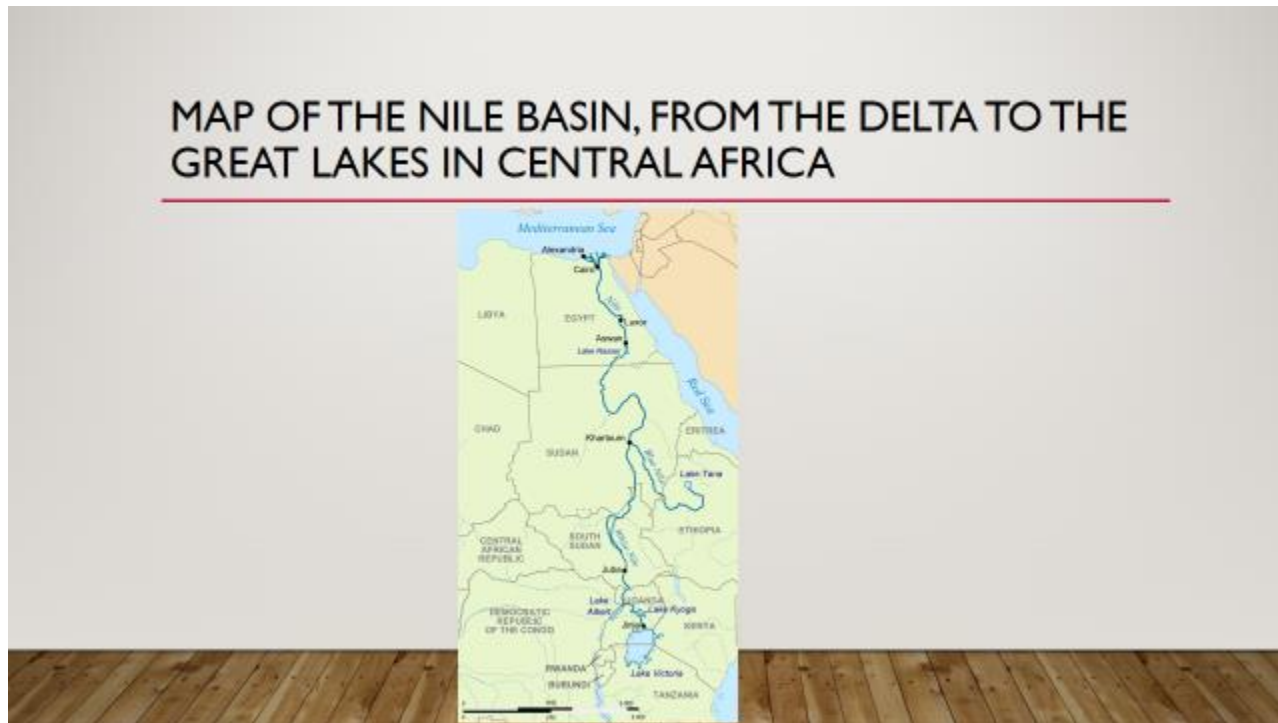


Figure 17-[Exhibit 4 on Ancient Egyptian Mathematics]



Figure 18- Ancient Egyptian multiplication by doubling and adding

EXAMPLE OF ANCIENT EGYPTIAN MULTIPLICATION BY DOUBLING AND ADDING

Ancient Egyptian Form Of Multiplication

25	×	32	
1		32	
2		64	
4		128	
8		256	
16		512	

Find a combination of numbers in the 1st column that add up to 25.

For a Demonstration that Ancient Egyptian math was identical with the mathematics of modern computers, please see the YouTube video, Egyptian Maths by Michael S. Schneider: <https://www.youtube.com/watch?v=Ih1ZWE3pe9o>

Figure 19-[Exhibit 5- Ancient Egyptian Coordinate Geometry]



Figure 20- How rectangular coordinates were used to define curves in 3rd Dynasty Egypt

COORDINATE GEOMETRY

In the 3rd Dynasty, ca 2700 BC, or 47 centuries ago, the Ancient Egyptians were using coordinates to define curves. For modern science, coordinates were independently invented by Descartes, in the 17th century, just four centuries ago.

Example of how rectangular coordinates were used to define curves in 3rd Dynasty, ca. 2700 BC

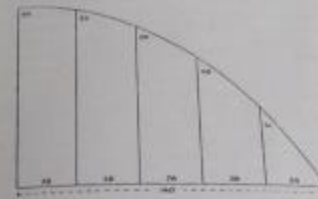


Fig. 2A. Arch drawing of the curve whose particulars are indicated on the various diagrams drawn in Fig. 2B.



An architect's diagram, defining a curve by co-ordinates. Probably III rd dynasty, Sappara. Lumpkin — Fig.

Figure 21-[Exhibit 6- Ancient Egyptian Chemistry related to food preservation]



Figure 22-A Dynasty II dinner preserved in a tomb until excavated in the 1930s

A DYN. II DINNER PRESERVED IN A TOMB UNTIL EXCAVATED IN THE 1930S, SOME 40 CENTURIES LATER

- In one case, in the tomb of a lady of the lesser nobility dating to the Second Dynasty, Emery found
- ... a complete meal, lying entirely undisturbed by the side of her coffin. Such was the state of its preservation that each dish was easily recognizable and the only knowledge that we lack is the order in which it was eaten. Some of the food was served on rough pottery platters and some on beautiful plates and bowls of alabaster and diorite. This gives us an indication of which dish was eaten hot, because, of course, a stone vessel is useless for heating purposes. The menu of this elaborate meal was as follows:
 - 1. A form of porridge made from ground barley
 - 2. A cooked quail, cleaned and dressed with the head tucked under the wing
 - 3. Two cooked kidneys
 - 4. A pigeon stew
 - 5. A cooked fish, cleaned and dressed with the head removed
 - 6. Ribs of beef
 - 7. Small triangular loaves of bread made from emmer wheat
 - 8. Small circular cakes
 - 9. Stewed fruit, possibly figs
 - 10. Fresh nabk berries from the sidder tree-- rather like cherries ...
- With this meal were small jars containing some form of cheese and pottery vessels for wine and perhaps beer. (Emery 1961: 243-246)

Figure 23- [Exhibit 7- Ancient Egyptian Aeronautics]



Figure 24-The Sakkara model glider and a US fighter plane[wing shape]



Figure- 25 Perspective diagrams of the Saqqara Bird or glider

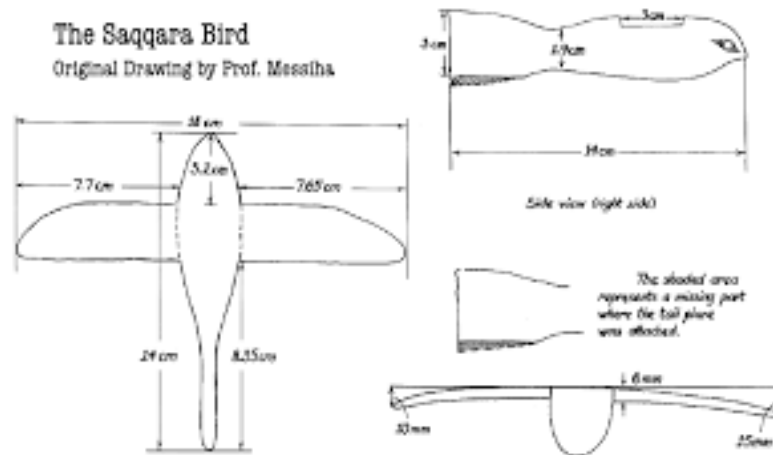


Figure 26-[Exhibit 8- Ancient Egyptian Astronomy and Calendars]



[EXHIBIT 8]

ANCIENT EGYPTIAN ASTRONOMY AND CALENDARS

The Calendar: The Egyptians has two calendars: The civil or solar calendar of 365 days in the year; and the Sothic or sidereal calendar of $365\frac{1}{4}$ days: It is the origin of the calendar we are still using today.

Figure 27-[Exhibit 9-Precolonial Astronomy in Kenya]



Figure 28- Namoratunga observatory

NAMORATUNGA OBSERVATORY



Figure 29- Namoratunga pillar alignments to stars

NAMORATUNGA OBSERVATORY: ALIGNMENT OF THE STONES TO THE STARS



Fig. 2. Pattern of stones at Namoratunga II

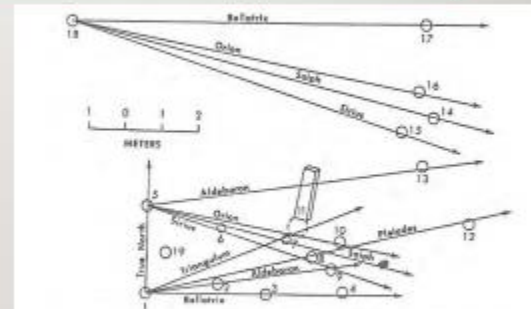


Fig. 3. Stone alignments relative to the seven stars at Namoratunga II.

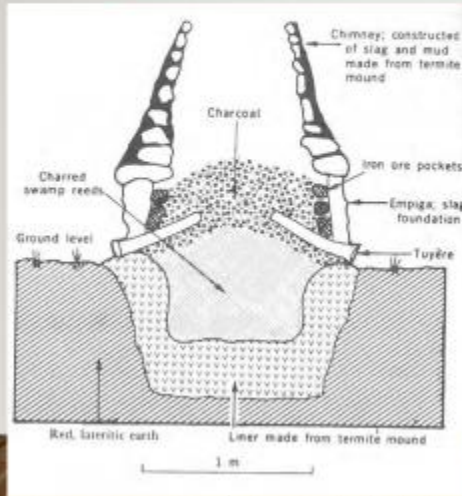
These 19 stone pillars are not randomly positioned. They are aligned to the seven stars and constellations in Fig. 3, by which the inhabitants of Namoratunga calculated their 12-month, 354-day year, back in the epoch of 300BC, 23 centuries ago.

Figure 30-[Exhibit 10 -Haya Iron-smelting semiconductor technology in Tanzania]



Figure 31-Haya carbon-steel smelters of ca. 2,000BP

HAYA CARBON STEEL SMELTERS: RECONSTRUCTED USING INFORMATION FROM HAYA ORAL TRADITION



In the center, ceramic blowpipes—called *tayere*—are placed at the base of the furnace over the pit, which has been filled with charred swamp reeds and other charcoal. These blowpipes will serve as a conduit for the air forced into the furnace and protect the air as it passes through them. At far right opposite, the furnace is constructed of large chunks of refractory slag consumed by termite mud. (Photo by Peter Schmidt)

Figure 32-[Exhibit 11-Modern science in Black Africa]



Figure 33-Modern science in 20th c. Africa- Discovery of Sanya Onabamiro

MODERN SCIENCE IN 20TH C.AFRICA: SÀNYÀ
ỌNÀBÁMIRO'S DISCOVERY OF TROPOCYCLOPS
MELLANBYI ONABAMIRO

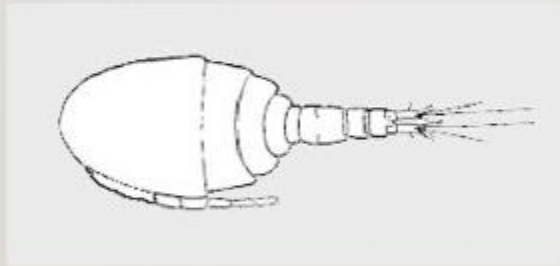


Figure 34-[Exhibit 12-180 Centuries of Crop Domestication in Africa[from 18000 BP]



Figure 35- Official Name and Classification of TROPOCYCLOPS

OFFICIAL NAME AND CLASSIFICATION OF TROPOCYCLOPS MELLANBYI ONABAMIRO

- ***Tropocyclops mellanbyi* Onabamiro, 1952**, AphialD,356269

Classification

Animalia (Kingdom)

Arthropoda (Phylum)

Crustacea (Subphylum)

Multicrustacea (Superclass)

Hexanauplia (Class)

Copepoda (Subclass)

Neocopepoda (Infraclass)

Podoplea (Superorder)

Cyclopoida (Order)

Cyclopidae (Family)

Tropocyclops (Genus)

Tropocyclops mellanbyi (Species)

Parent

Tropocyclops Kiefer, 1927

Orig. name

Tropocyclops mellanbyi Onabamiro, 1952

Figure 36-Plant domestication zones in the World.

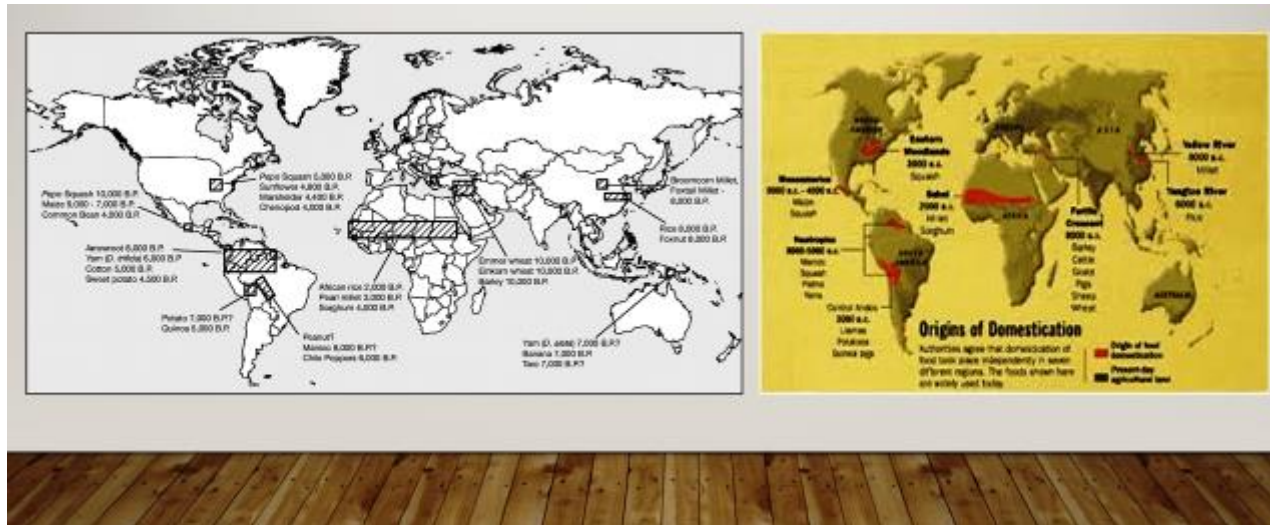


Figure 37- Plant domestication zones in Africa-detailed map

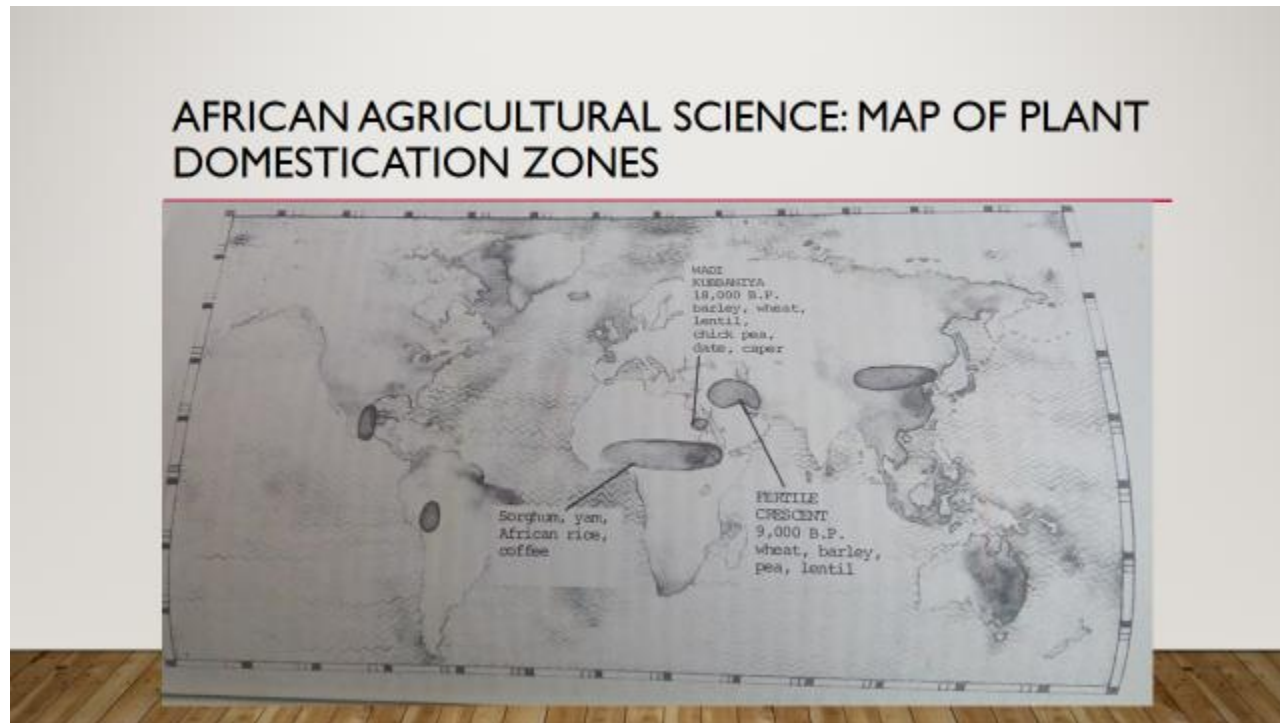


Figure 38-[Exhibit 13- 50 centuries of Medical science and technology in Black Africa]

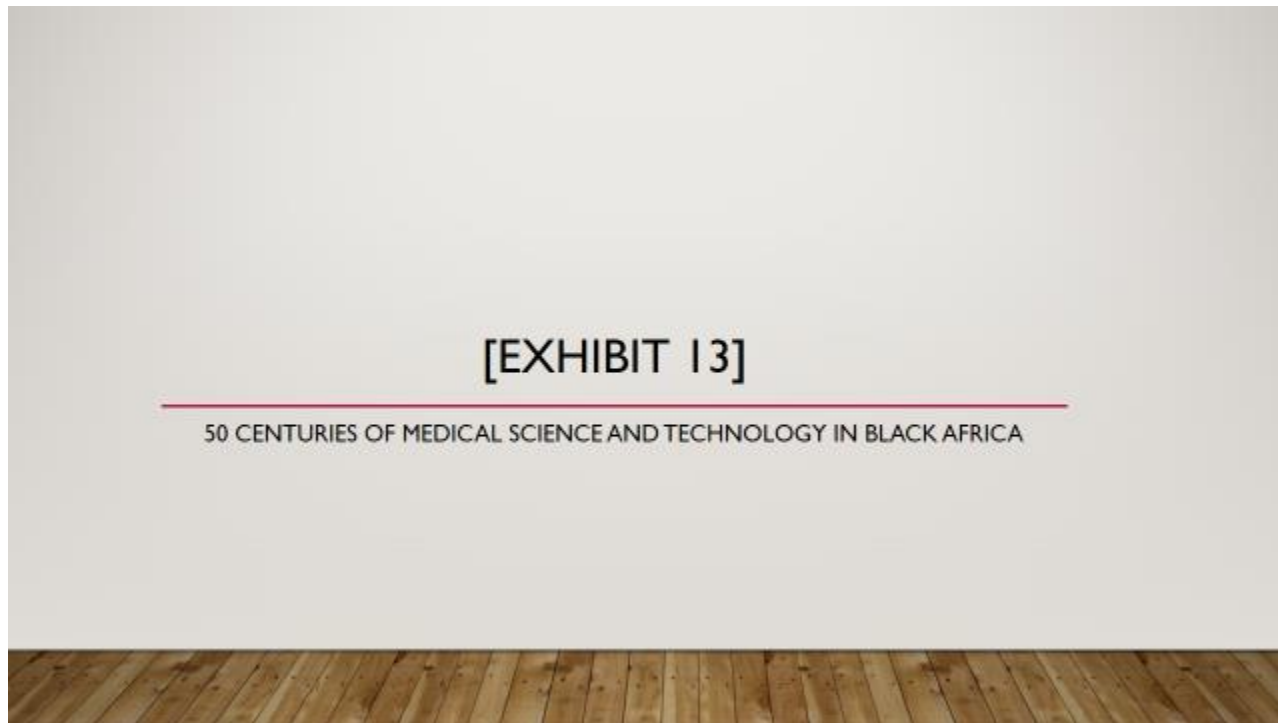


Figure 39-Some of the more than 200 Anatomical terms from Ancient Egyptian Medical papyri

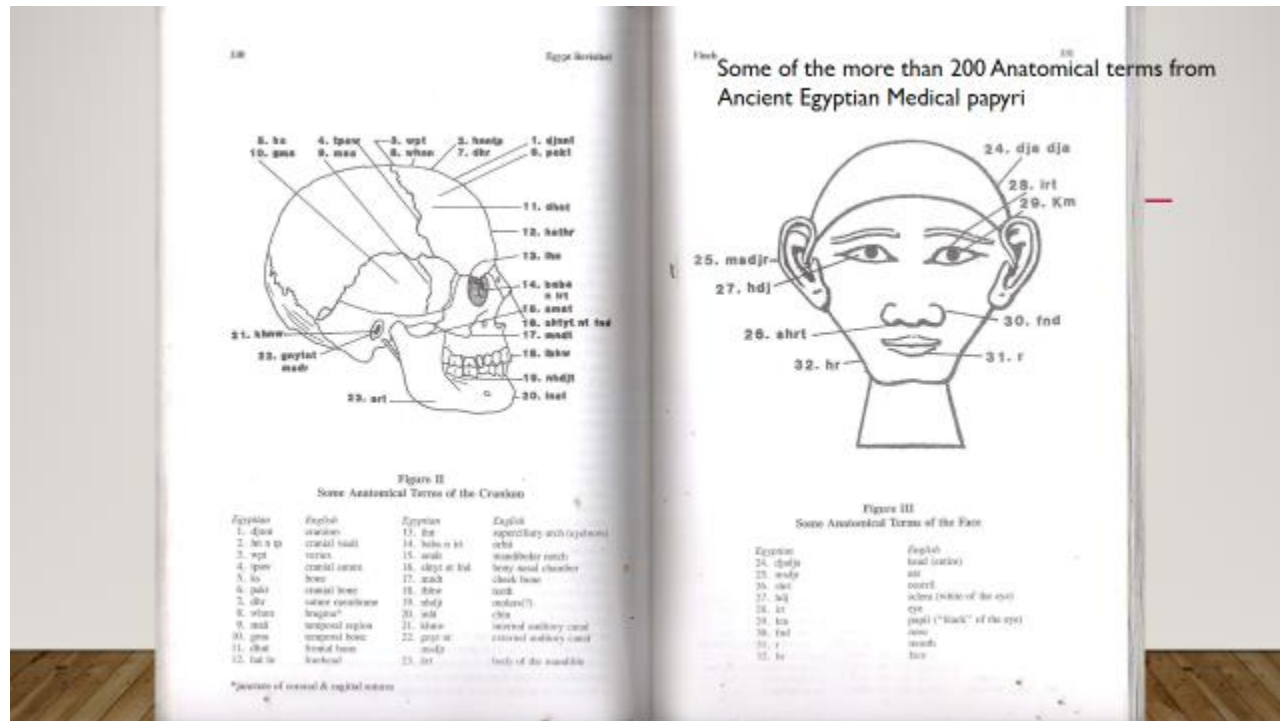


Figure 40- Some of the more than 200 Anatomical terms from Ancient Egyptian Medical papyri

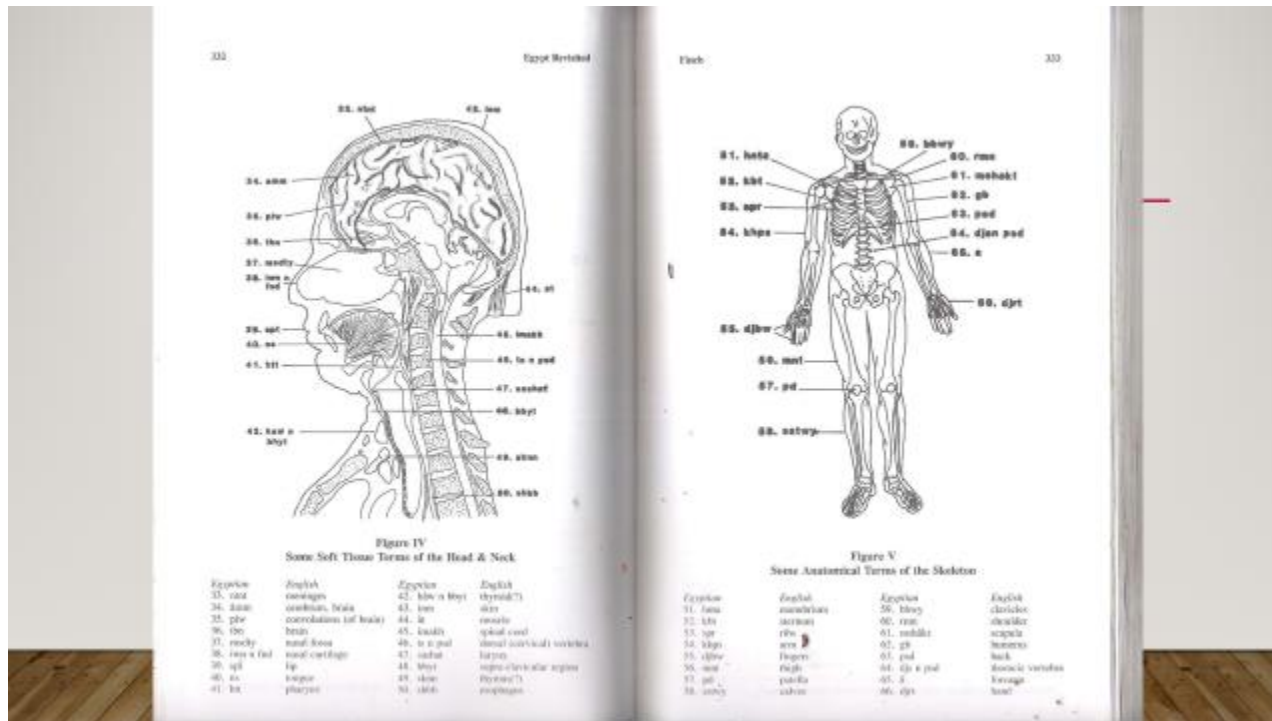


Figure 41- Some of the more than 200 Anatomical terms from Ancient Egyptian Medical papyri

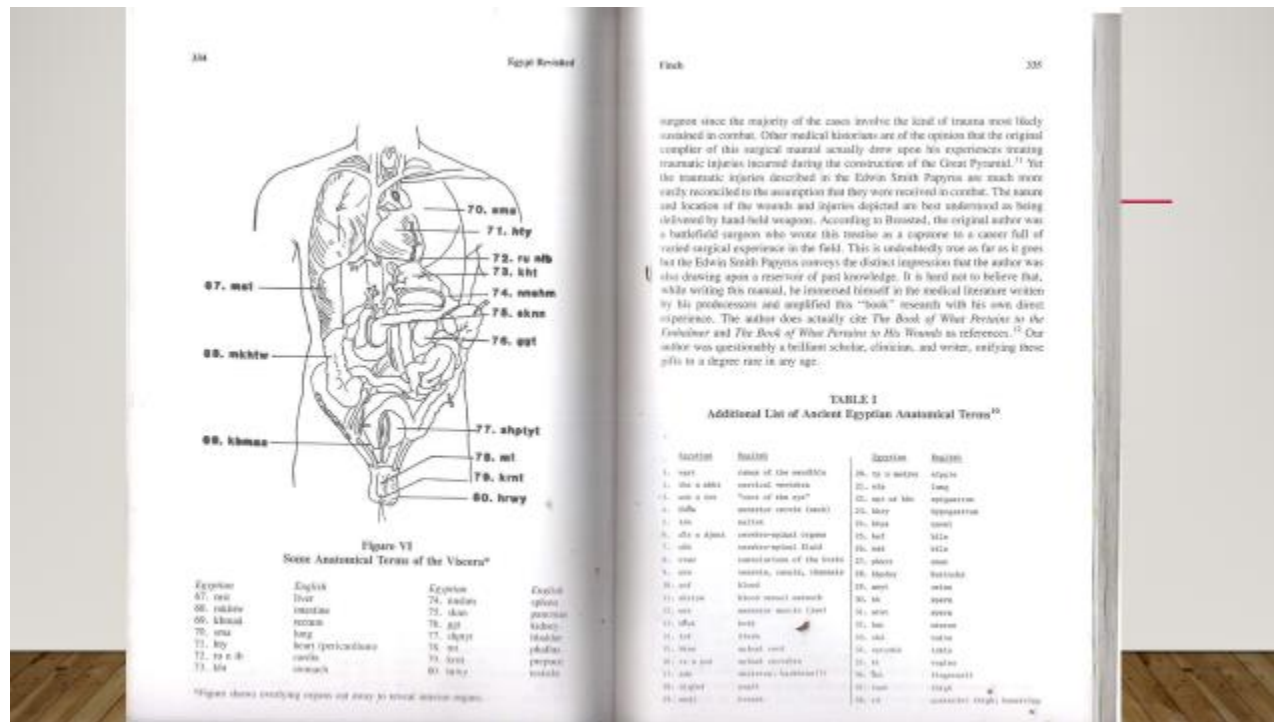


Figure 42-Male circumcision surgery, Sakkara, VI Dynasty ca. 47 centuries BP

MALE CIRCUMCISION SURGERY, SAKKARA, VI
DYNASTY, CA. 47 CENTURIES BP

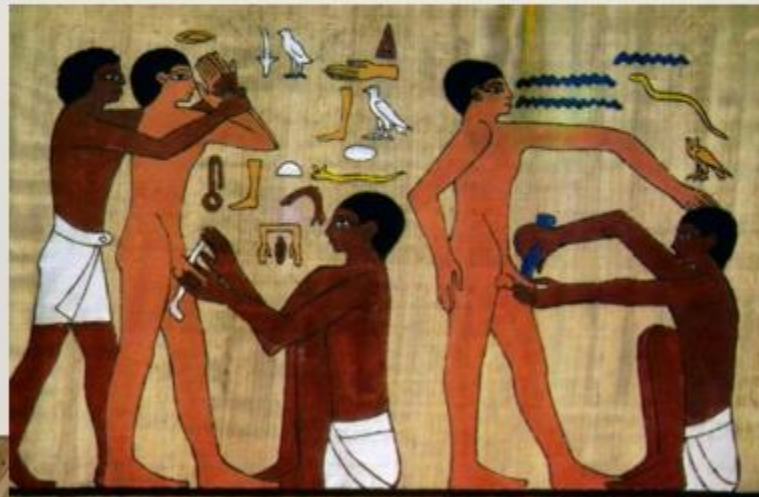


Figure 43-Smallpox inoculation introduction by African

AFRICAN SMALLPOX INOCULATION WAS INTRODUCED INTO EARLY 18TH C. AMERICA BY AN ENSLAVED AFRICAN ONESIMUS.

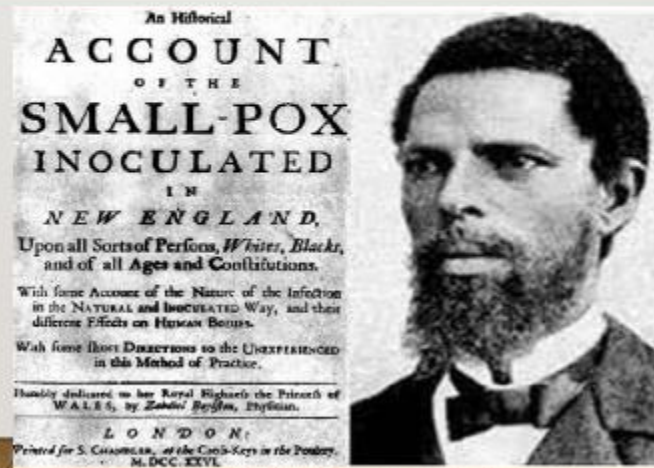


Figure 44-Bunyoro surgery theatre

BUNYORO SURGERY THEATER DURING A CAESAREAN OPERATION, 1879. THEIR PROCEDURE SHOWS THEIR KNOWLEDGE OF ANAESTHESIA AND ANTISEPSIS.



Fig. 8. Illustration from Dr. R.W. Felkin's description of the Caesarean section. *Edinburgh Medical Journal*, 1884.



Compare the Bunyoro surgery theatre with the modern Operating Theatre on the right.

Figure 45-Nyerere mocks and kills Union Government at Cairo OAU in 1964



Rais Mwalimu Julius K. Nyerere anafuatana pamoja na Rais Abdel Nasser na Mtukufu Emperor Haile Selessie kwenda kwenye Mkutano wa Viongozi wa Afrika.-
The President, Mwalimu Julius K. Nyerere accompanied by President Nasser and Emperor Haile Selessie is going to the Conference Room.