

Samiru Alhassan (Ghana),
Fidel Castro Parimala Rangan (India)

National Research Tomsk Polytechnic University, Tomsk

Scientific adviser: Loyko Olga Timofeevna, Doctor of philosophy, professor

THE FORGOTTEN LEGACIES OF AFRICA IN SCIENCE

Abstract

It will interest you to know Africa has the oldest scientific achievements in the world. This culture of achievements emerged at least 40,000 years ago in Africa. Unfortunately, most people including Africans are unaware of these accomplishments, as the history of Africa, beyond ancient Egypt, is seldom publicized. Maybe the horrific stories from slavery helps to put a lid on this rich and important history. As sad as it may be, most discussions on modern philosophy dwell on the Greek philosophers with no reference to Africans. It is worth saying that most of the scientific break-through happening now are on the back of discoveries of thousands of years from Africa. While the remarkable black civilization in Egypt remains alluring, there were sophistications and impressive inventions throughout ancient sub-Saharan Africa as well. In this paper, we attempt to send an electrical impulse to this long-deadened nerve. I can only fly by this vast plane of achievements. Despite this, it still should be evident that the ancient people of Africa, like so many other ancients of the world, definitely had their genius. As late as 8,000 years ago, people in present-day Zaire developed their own numeration system, as did Yoruba people in what is now Nigeria. Ancient Tanzanian furnaces could reach 1,800°C — 200 to 400°C warmer than those of the Romans. Between 1,500 and 2,000 years ago, advances in Tanzania, Rwanda and Uganda surpassed those of Europeans standards. During the Timbuktu era, the Julian calendar was established with the year divided into 12 parts and a developed yearlong calendar system containing 365 $\frac{1}{4}$ days. Clocks were made with moving water. The famous sundial-like clocks were used. The peak in Astronomy with heliocentric views of the solar system. The Scientist developed algorithm that accurately oriented Timbuktu to Mecca. The scientist recorded some astronomical events including a meteor shower in August 1583. They went as far as making diagrams of planets and orbits which made use of complex mathematical calculations. In conclusion, the article throws light on the contribution of Africa to science early-on as far back as 40,000 years ago. Then finally, expounding on the contribution of Africans in present day inventions to solving everyday problems.

Introduction

Africa can boast of having the oldest record of technological advancement in the world. East Africa specifically is the home for the development of early toolmaking industry about 2.3 million years ago. The oldest abstract art in the world is a shell necklace dated to 82,000 years ago from the Cave of Pigeons in Taforalt, eastern Morocco [1]. There are evidences that Stone Age humans around 100,000 years ago had an elementary knowledge of chemistry in Southern Africa, and that they used a specific recipe to create a liquefied ochre-rich mixture [2]. According to Henshilwood "This isn't just a chance mixture, it is early chemistry [3]. Currencies have been made out of a number of objects, notably metals, salt, ingot, knives, iron chains, cowrie shells etc. Since the Medieval Ages, Africa has been the major supplier of gold in the world trade. The Trans-Saharan trade was totally controlled by the Sahalian Empire where majority of its gold was traded with Europe and North Africa. The Almoravid dinar and the Fatimid dinar were printed on gold. In East Africa, the Swahili traders also provided gold to Asia across the Red Sea and the Indian Oceans trade routes [4].

1.1 Geographical makeup of Africa

The figure below is the schematic view of Africa in Five shades of colors representing the location of the various sectors of the continent as North, South, Central, East and West Africa. There are 54 countries with over 3000 indigenously spoken languages. A country like Nigeria could boast of 500 different languages. The major international languages spoken are English, French, Portuguese and Arabic.

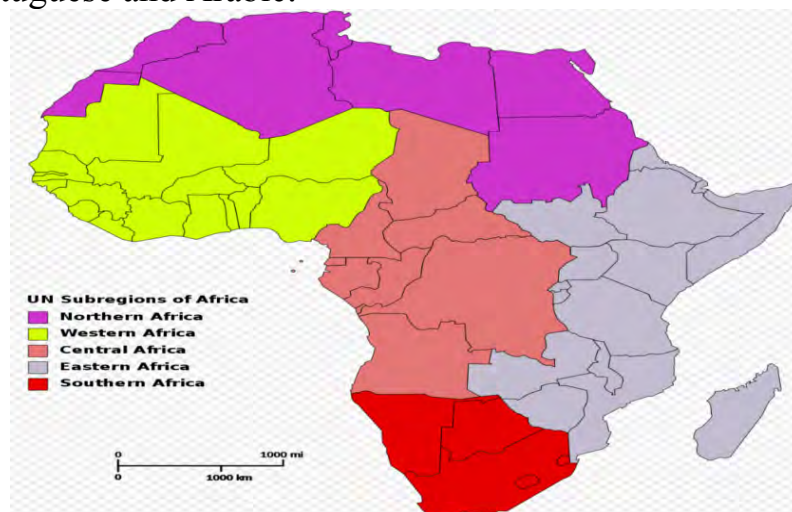


Fig. 1.0 Schematic view of Africa [5].

2.1 African Contribution Early-on

It will astonish you to know that ancient African cultures birthed discoveries in astronomy. Many of these are foundations on which we still rely on, with so much advancement that their mode of discovery still cannot be

understood. Egyptians charted the movement of the sun and constellations and the cycles of the moon. The months were divided the year into 12 parts and developed a year-long calendar system containing $365 \frac{1}{4}$ days [6]. Clocks were made with moving water and sundial-like clocks were used. It is essential to mention the Dogon people of Mali who amassed a wealth of astronomical observations [6]. Most of their discoveries were far advanced. The Dogon knew of Saturn's rings, Jupiter's moons and the spiral structure of the Milky Way and the orbit of the Sirius star system. Hundreds of years ago, they plotted orbits in this system accurately through the year 1990. A structure known as the African Stonehenge in present-day Kenya (constructed around 300 B.C.) was a remarkably accurate calendar [6]. The most essential foundation in mathematics were laid down for future break-through in complex problems from Africa. More than 35,000 years ago, Egyptian scripted textbooks in mathematics covered division, multiplication of fractions, geometric formulae to estimate area and volumes of shapes [6]. Distances and angles were calculated, algebraic equations were solved and mathematically based predictions were made of the size of floods of the Nile. The circle was also considered to have 3600 and estimated π at 3.16 [6]. Present day Zaire people developed a numeration system akin to that of the Yoruba people of Nigeria. Nigeria, South Africa and Egypt to mention a few countries were well advanced in medicine than Europe. Most of these medicinal practices were carried out using plants with salicylic acid for pain as do aspirins. Kaolin for diarrhea as do Kaopectate and extracts which has been confirmed only recently to Gram positive bacteria [7]. Other plants used had anticancer properties, caused abortion and treated malaria, and these have been shown to be as effective as many modern-day Western treatments. The discovery of ouabain, capsicum, physostigmine and reserpine were accomplished by Africans [7]. Some medical procedures performed in ancient Africa before any part of Europe included vaccination, autopsy, limb traction and broken bone setting, bullet removal, brain surgery, skin grafting, filling of dental cavities, installation of false teeth, anesthesia and tissue cauterization [6]. It is worth mentioning that surgeries were performed under antiseptics conditions as it was relatively unknown to Europe. Around 800, the first psychiatric hospital and insane asylum in Egypt was built by Muslim physicians in Cairo. Around 1100, the ventilator is invented in Egypt [8]. The most obvious with regards to architecture is engineering feats of the Egyptians: the bafflingly raised obelisks and the more than 80 pyramids. The largest of the pyramids covers 13 acres and is made of 2.25 million blocks of stone [6]. From the South in Zimbabwe and Mozambique had massive stone complexes at the hub of the cities. A 250 meter long and 15,000 tonnes curves granite wall [9].

African Contribution Currently

Africa faces a wide variety of difficulties. The vast majority of its countries are developing nations with poor infrastructure, anemic economies and grossly mismanaged natural resources. Nonetheless, Africa contributes to the world by the contribution of its human resource in some very notable inventions. In this article, we will elaborate on a number of such notable inventions:

Table 1

List of Some African Inventors

No.	Name(s)	Inventions	Country
1.	Dr. Arthur Zang	Cardiopad	Cameroon
2.	Dr. Trevor Lloyd Wadley	Micro-distance meter (Tellurometer)	South Africa
3.	Dr. Allan McLeod Cormack	CT Scanner	South Africa
4.	Rachid Yazami	Lithium-ion and ion batteries	Morocco
5.	William Kamkwamba	Electricity-generating Windmill	Malawi
6.	Louis Stevenson & Liebenberg Lindsay	Cyber tracker	South Africa
7.	Dr. Gordon Mayhew-Ridgers & Paul van Jaarsveld	Quiet Cellular Antenna Technology	South Africa
8.	Philip Emeagwali	Application of the CM-2 massively-parallel computer. (Modelling)	Nigeria
9.	Dr. Thomas Owusu Mensah	Pioneer Fiber optic technology	Ghana
10.	George Pratley	A glue used by Apollo XI	South Africa
11.	Ferdinand Chauvier	Pool cleaner vacuum cleaner	South Africa
12.	Ing. Kwadwo Safo Kantanka	Cars, Military hardware's	Ghana

4.0 Conclusion

In conclusion, the article throws light on the contribution of Africa to science early-on as far back as 40,000 years ago. Situates the struggles of Africans from the fall of slavery to the contributions made by Africa and Africans even during these hard times. Then finally, expounding on the contribution of Africans in present day inventions to solving everyday problems.

5.0 Recommendations

Blacks can be found in almost all continents of the world. In some countries, they constitute a large section of the minority like in America. African Americans have contributed greatly to inventions. We will need to take a critical look into that aspect since this article only acknowledges such contributions and goes no further than that.

REFERENCES

1. “Discovery of the Oldest Adornments in the World”, (2007), Science-daily.com, Retrieved August 2012.
2. C.S Henshilwood, et al, (2011), “A 100,000-year-old ochre-processing workshop at Blombos Cave, South Africa, - PubMed”, Science, 334 (6053): 219 -22,
3. Ehret, Christopher (2002), “The Civilization of Africa”, Charlottesville: University of Virginia Press, pp. 22, ISBN 0-8139-2085-X.
4. “Civilizations in Africa: The Iron Age South of the Sahara”, (2007), Washington state University.
5. https://upload.wikimedia.org/wikipedia/commons/f/fl/Africa_map_regions.svg
6. Woods, “G. Science in Ancient Egypt” (1988).
7. Van Sertima, I “The Lost Sciences of Africa: An Overview.” Blacks in Science: Ancient and Modern, 7 – 26, (1983).
8. Durant Will, (1950), “The story of Civilization IV: The Age of Faith, Simon and Schuster, New York, pg. 330 – 31.
9. Asante, M. et al. “Great Zimbabwe: An Ancient African City-State.” Blacks in Science: Ancient and Modern, 84–91 (1983).

Zhang Weijia (China)

National Research Tomsk Polytechnic University, Tomsk

Scientific adviser: Gubin Evgeny Ivanovich, associate professor

SIMPLE MACHINE LEARNING MODEL ABOUT PREDICTING THE PRICE OF GOLD

Introduction

Gold is a symbol of wealth and luxury. Compared to currency, gold is more valuable and is largely immune to inflation. In today's volatile situation, gold has a high investment value.

The goal of this work is to explore the secrets of the price of gold.