

United Nations Conference Centre, Addis-Ababa, Ethiopia

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Conference from September 1st to 4 on

REGIONAL AND INTERREGIONAL COOPERATION TO STRENGTHEN
BASIC SCIENCES IN DEVELOPPING COUNTRIES



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THREE PROPOSALS TO STRENGTHEN REGIONAL,
CONTINENTAL AND INTERCONTINENTAL COOPERATIONS
IN FAVOUR OF BASIC SCIENCES IN AFRICA

Plan

1. Introductory African wisdom sentence
2. Africa, the cradle of modern Humanity, Arts, Sciences and Technologies
3. Institutes for Excellence in Arts, Sciences and Technologies
4. International Summit on the Economy of Knowledge in Africa
5. On line Networks of Researchers and Thesis Students in Mathematics

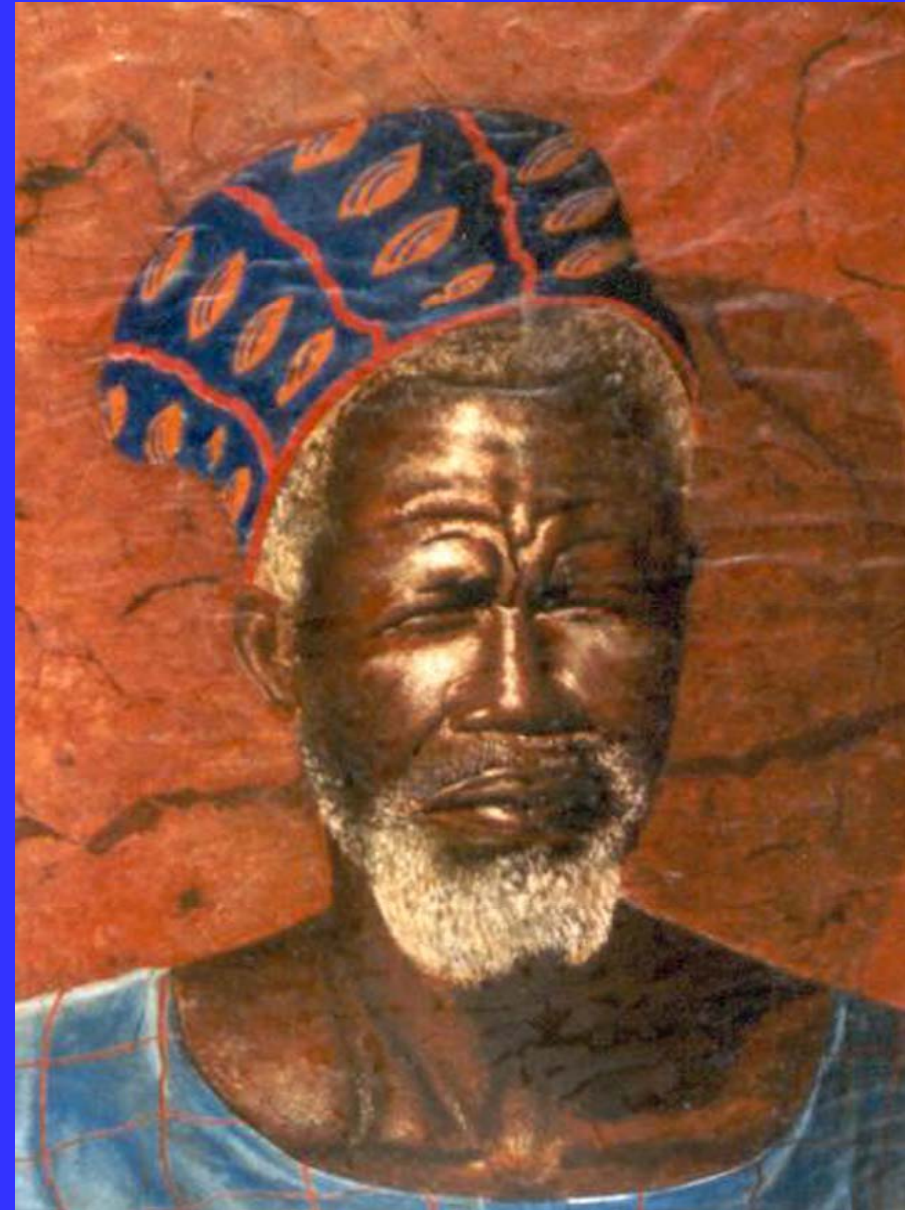
1. INTRODUCTORY AFRICAN WISDOM SENTENCE

*« Ye Omou nya afike o le yi oa,
Nya afike osoa » (in Gengbe, spoken
in Benin, Ghana, and Togo)*

*« Ne me nya afisi ne le yiyima,
Na nya afisi ne tsoa » (in Ewegbe,
spoken in the same countries)*

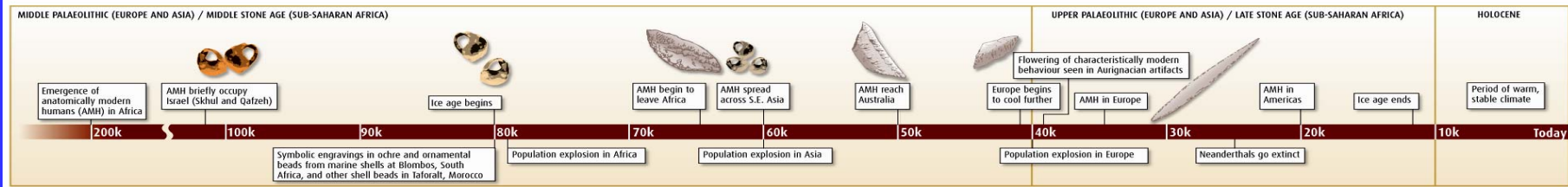
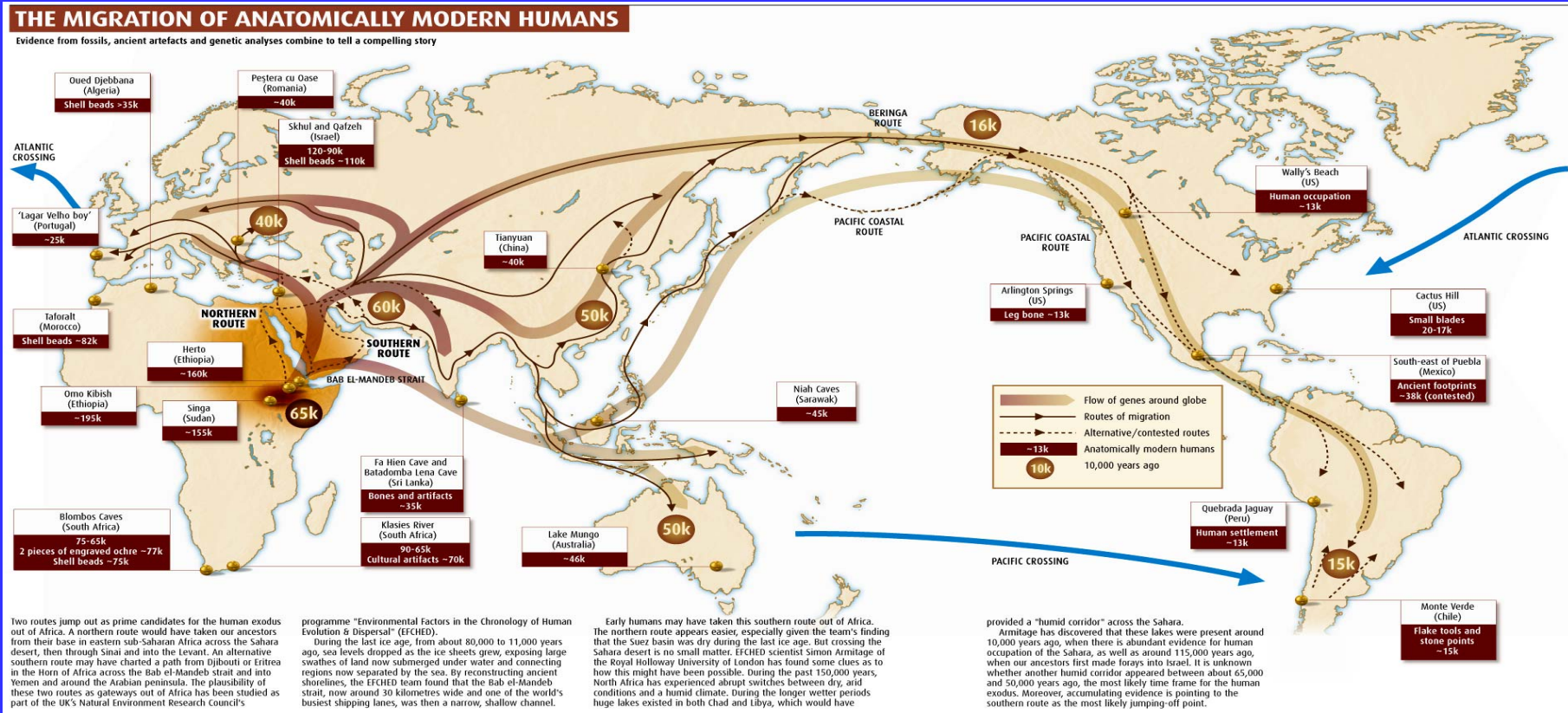
*« If you dont know where you are
going to, know where you are
coming from »*

*« Si tu ne sais pas où tu vas, saches
d'où tu viens »*



2. AFRICA, THE CRADLE OF MODERN HUMANITY, ARTS, SCIENCES AND TECHNOLOGIES

Africa, the cradle of modern humanity for 200 000 years



Africa, the cradle of mathematics and geometry for 77 000 years

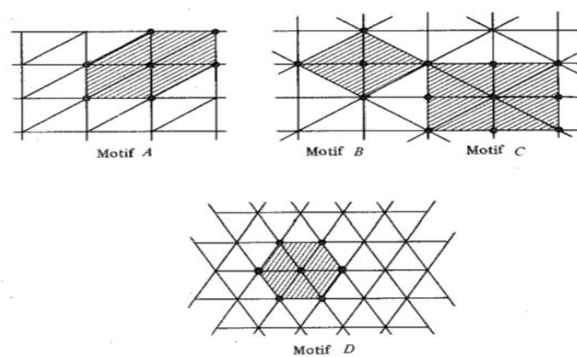
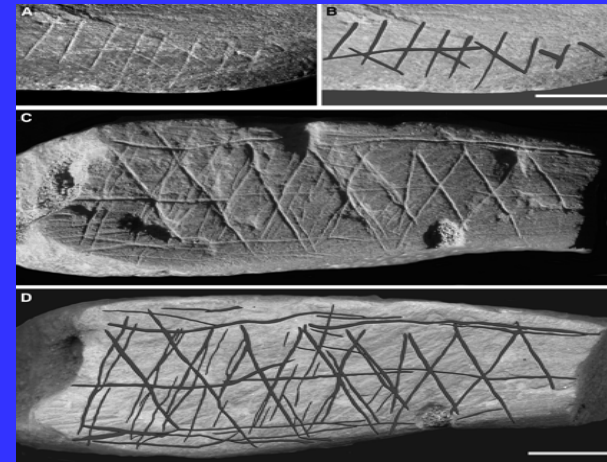


Fig. 9.6 Maillages donnant lieu à l'étude de convergence de la Réf. 9.7.

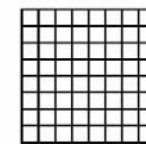
Pavages réguliers (2)

Trois solutions possibles dans \mathbb{R}^2 :



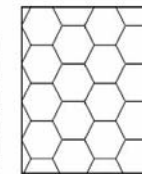
pavage triangulaire

(3)



pavage carré

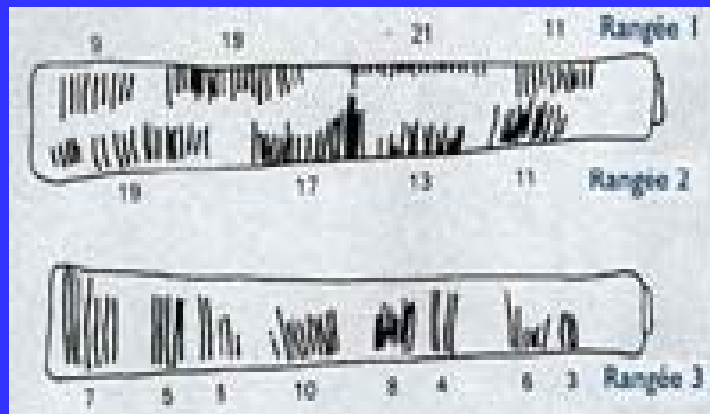
(4)



pavage hexagonal

(6)

Africa, the cradle of arithmetic for 25 000 years



Multiplication Egyptienne

Numération Hiéroglyphe

100	100 000	1 000 000
1000	1987	10 000

Papyrus de Rhind

12 x 12 = 144

1	12
2	24
4	48
6	96

96 = 144

Africa, the cradle of technologies and iron metallurgy for 5 500 years



Figure 2 : Localisation des sites datés les plus anciens de l'âge du fer en Afrique (entre 900 BC et 2900 BC).

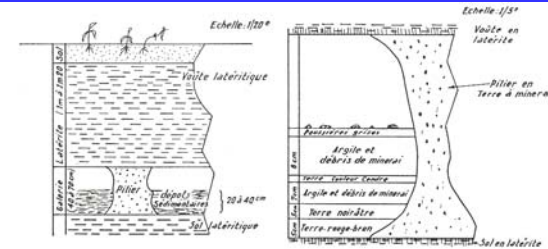


Figure 1-a

Figure 1-b

Figures 1-a et 1-b : Coupes verticales des galeries de mines souterraines de Tele-Nugar (Tchad).

"Le souterrain, levé par le lieutenant BAUDIN, offre plus d'un kilomètre de galeries et des salles qui ont plus de 22 m sur 10. Cette ancienne exploitation minière comporte un certain nombre de grandes salles auxquelles on accédait par plusieurs entrées... La voûte latéritique est percée de place en place de trous d'aération... les galeries reliant les salles ont environ 6 m de large et ont elles-mêmes des issues directes sur l'extérieur" (d'après le général DERENDINGER).
Coupes et texte tirés du *Journal de la Société des Africanistes*, 1936, p. 197 à 204, article du général DERENDINGER.

ANRCH n° 45 1995-1996

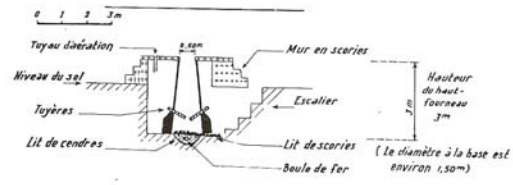
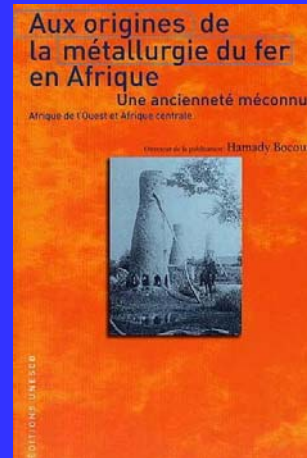
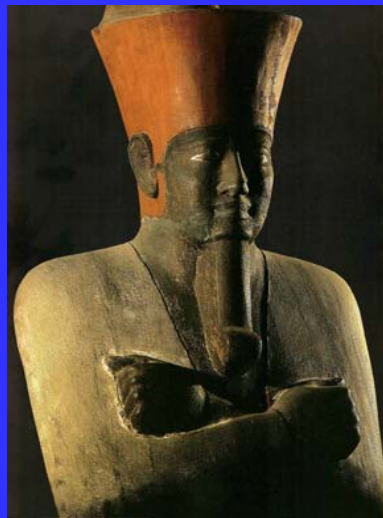
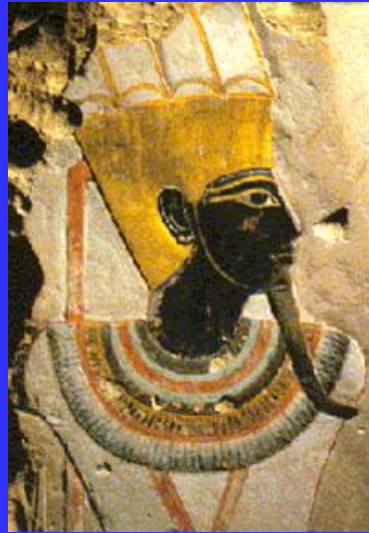


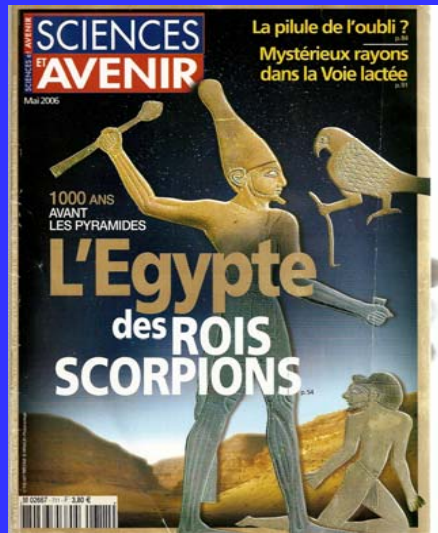
Figure 6 : Haut-Fourneau semi-souterrain; coupe verticale d'un haut fourneau près de Dédougou (Haute-Volta), d'après R. H. FORBES et Cl. FRANCIS-BGEUF. Ce type de haut fourneau, que l'on trouvait en pays bobo, est plus compliqué dans sa structure et assurait de meilleures conditions de travail. Le fourneau est renforcé au tiers inférieur. À cet endroit, 6 tuyères en argile durcie, d'environ 0,6 m de long convergent vers l'intérieur. Il est construit dans une fosse de 2 m de profondeur.



Ancient Egypt, the window of black Africa



Africa, the cradle of writing, alphabet and history for 5 400 years



L'ALPHABET HIÉROGLYPHIQUE

signe trans- cription	objet représenté	son approximatif	signe trans- cription	objet représenté	son approximatif
	vautour	aleph hébreu		h	cour de maison
	roseau fleuri	y		b	écheveau de lin tressé
	double roseau fleuri			b	placenta (?)
	double trait oblique	(2)		h	queue d'un marmite l'allemand
	avant-bras 'ayin hébreu			h	verrou
	petite caille	ou		s	étiole pilée
	abréviation hiéroglyphique du signe w			s	bassin d'eau ch pente sablonneuse
	b	p		k	corde à attache
	p			p	support de jarre
	f	m		t	galette de pain
	chouette			t	pilon
	m	d		d	corde pour entraver les animaux
	filet d'eau			d	main
	n	r		r	serpent
	couronne rouge			r	
	r			r	

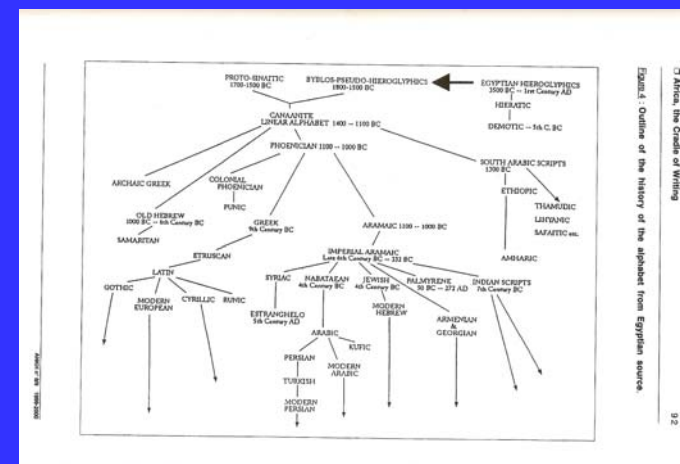
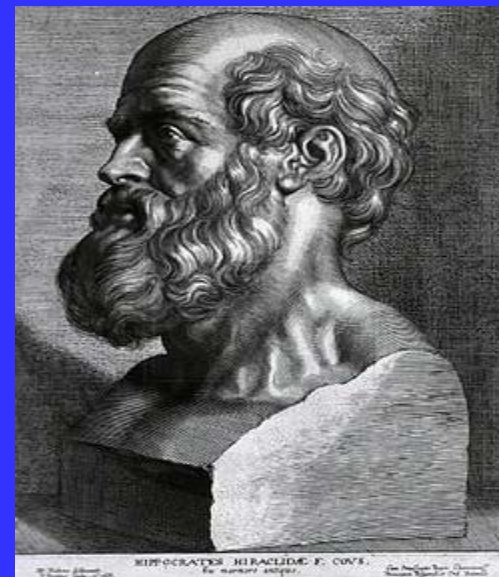


FIGURE 1. Origins of the alphabet from Egyptian sources.

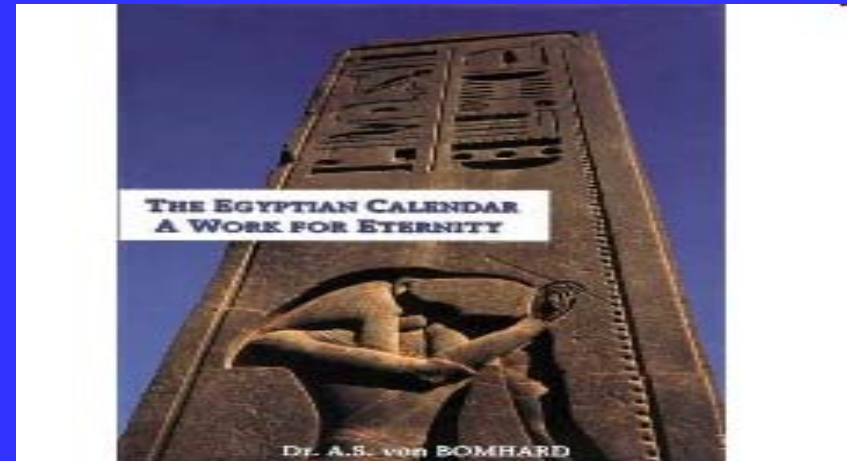
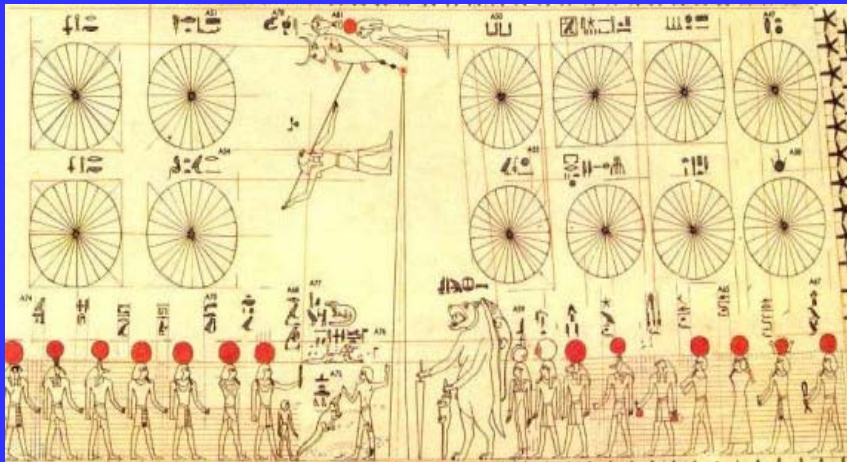
Africa, the cradle of town planning, l'architecture and fine arts for 10 000 years



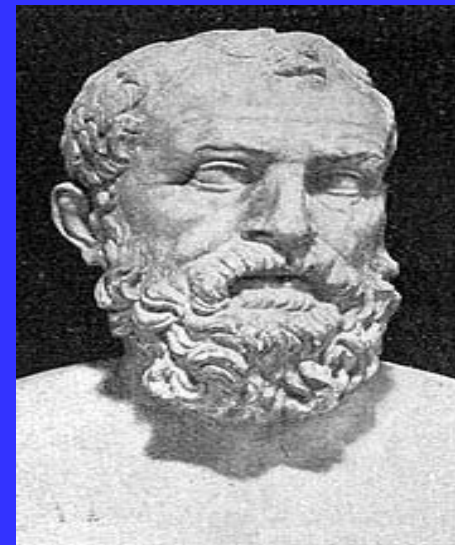
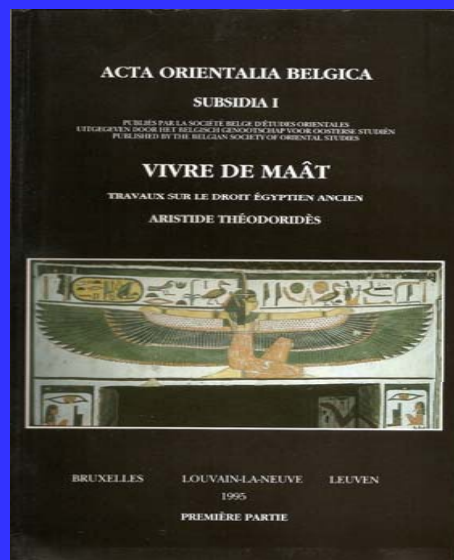
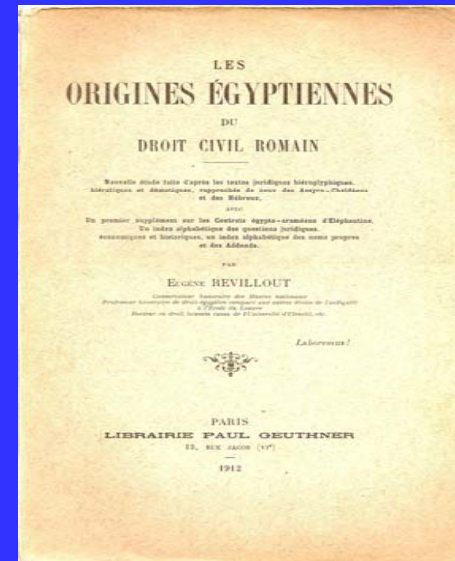
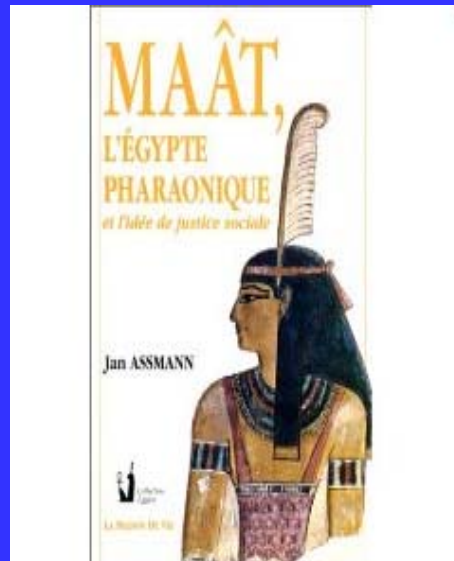
Africa, the cradle of medical science for 5 000 years



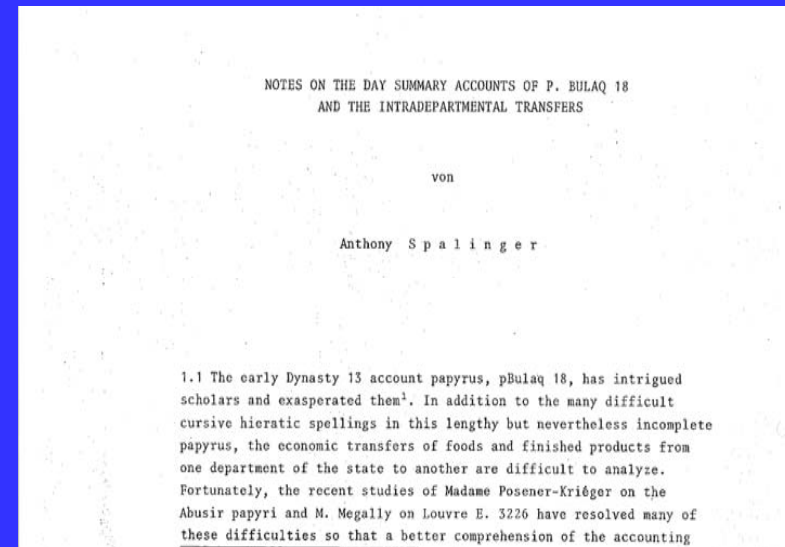
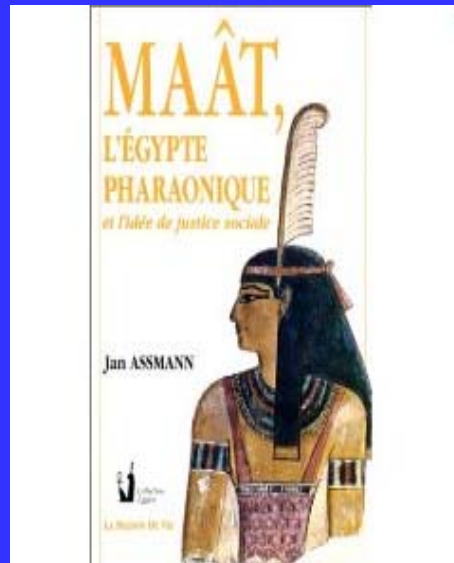
Africa, the cradle of astronomy for 8 000 years



Africa, the cradle of law and political sciences for 5 000 years

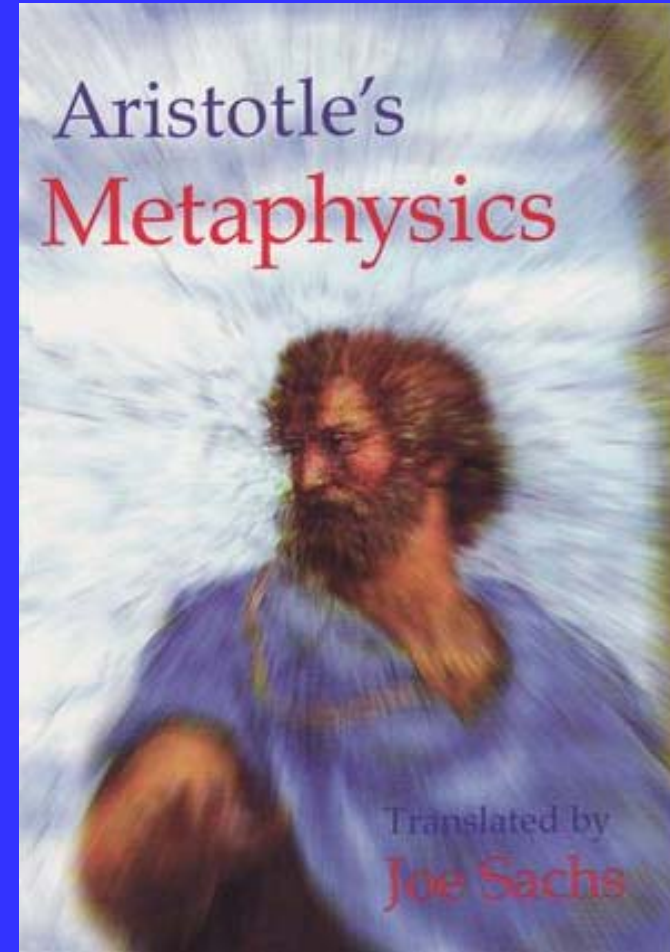


Africa, the cradle of economical sciences for 5 000 years



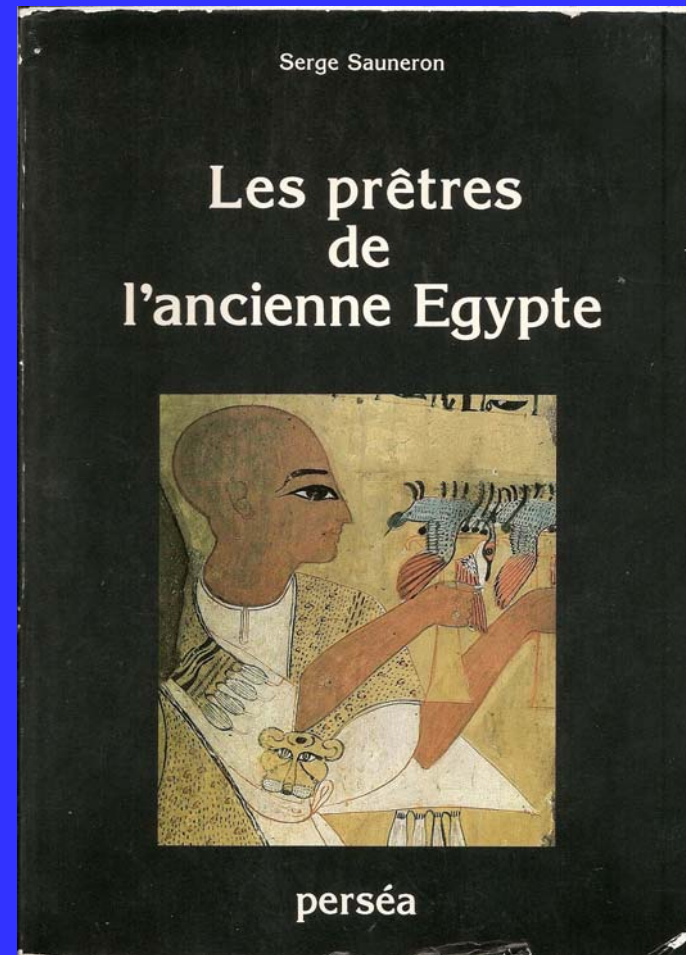
The lecture of the history of arts, sciences and technologies by Aristotle in his *Metaphysics*

The philosopher Aristotle, like all greeks masters before and after him, was so impressed by the spectacular developpement of all basis and modern arts, sciences and technologies in Egypt since the begining of the historical period initiated in Egypt and not in Summer thanks to Egypt anteriority in invention of writting and alphabet, after the very long germination of these achievements of modern civilization in the heart of Africa durind 70 millenium, that Aristotle proposed in his book Mathaphysics the following modern, sociological and even marxist lecture of the history of arts, sciences and technologies in Egypt, with the leadership of the previledged class of the priests :



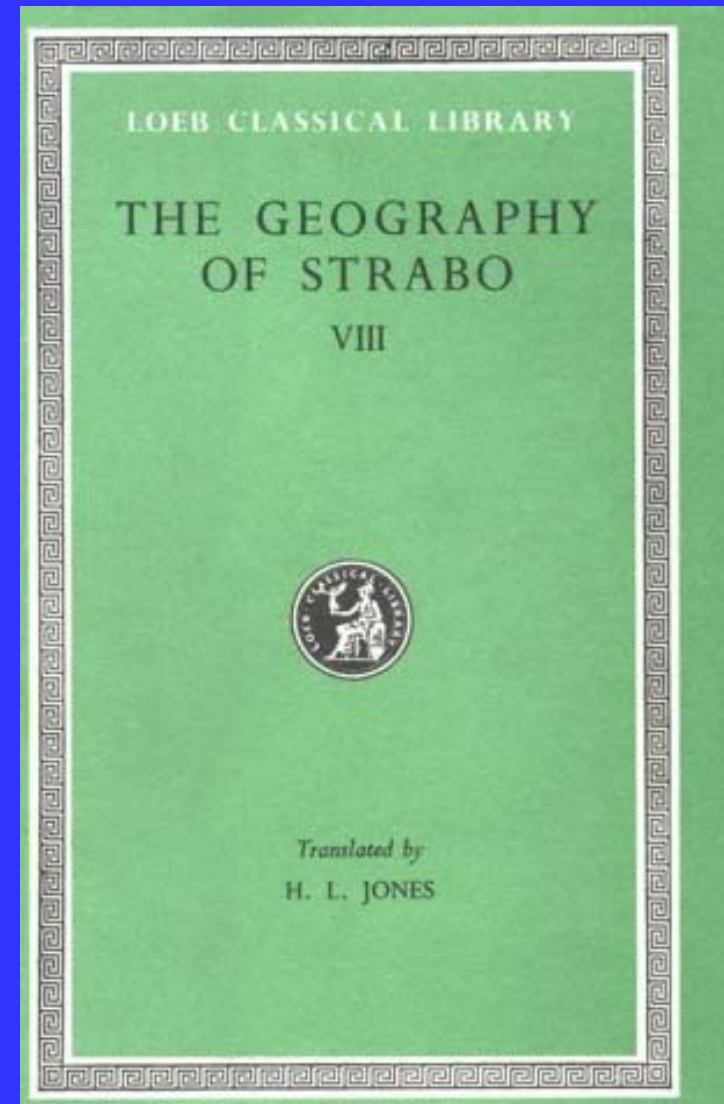
Extract from the first chapter of Aristotle's *Metaphysics*

As more arts were invented, and some were directed to the necessities of life, others to recreation, the inventors of the latter were naturally always regarded as wiser than the inventors of the former, because their branches of knowledge did not aim at utility. Hence when all such inventions were already established, the sciences which do not aim at giving pleasure or at the necessities of life were discovered, and first in the places where men first began to have leisure. This is why the mathematical arts were founded in Egypt; for there the priestly caste was allowed to be at leisure.



Extract from the chapter 17 of Strabo's (-64 _ + 23) Geography

In Heliupolis I also saw large houses in which the priests lived; for it is said that this place in particular was in ancient times a settlement of priests who studied philosophy and astronomy; but both this organisation and its pursuits have now disappeared ...However, at Heliupolis the houses of the priests and schools of Plato and Eudoxus were pointed out to us; for Eudoxus went up to that place with Plato, and they both passed thirteen years¹⁶¹ with the priests, as is stated by some writers; for since these priests excelled in their knowledge of the heavenly bodies, albeit secretive and slow to impart it, Plato and Eudoxus prevailed of them in time and by courting their favour to let them learn some of the principles of their doctrines; but the barbarians concealed most things. However, these men did teach them the fractions of the day and night which, running over and above the three hundred and sixty five days, fill out the time of the true year.¹⁶² But at that time the true year was unknown among the Greeks, as also many other things, until the later astrologers learned from the men who had translated into Greek the records of the priests; and even to this day they learn their teachings, and likewise those of the Chaldaeans.



Comments on Aristotle's and Strabo's Analysis

- According to the confirmation of modern egyptologists like Sauneron in his just shown book, Ancient Egypt society was organised such that besides many classes like the one of scribes of farmers, there was the one of priests the emblematic figure of whom was the pluridisciplinary scholar Imhotep.
- These priests who had the social status of state servants formed a kind of state corps devoted to both religious, scientific, literary and artistic activities, specially to fundamental and applied researches in many fields like mathematics, astronomy, medicine, architecture.
- This social status of researchers was unique in the history until the creation of the social corps of professional researchers in advanced modern states from the beginning of the 20th century, specially in the USA and former Soviet Union, and in France with the creation of CNRS, the National Scientific research Centre.
- It is this unicity of a social organization with a heavy engagement of the state which explains clearly, as Aristotle wrote about mathematics, the soectacular growing of arts, sciences and technologies in Ancient Egypt hence in Black Africa, during three millenniums, without any comparison with any civilization in the history, even with the western civilization even counting from the Classical Greek period until now.
- Thanks to the genius and the works of these professional researchers, Ancient Black Egypt became the place by excellence of the culture of excellence, elaborated in their « centres of excellence » called « House of Life », up to such a perfection that according to Prophet Ezechiel in chapter 31 of his book, God himself asked him to proud this civilization saying : « Who is comparable to you in your greatness ? You were beautiful in your greatness ! »

Lessons from Aristotle's and Strabo's Analysis

- To renew with the « culture of excellence in arts, sciences and technologies », the whole Africa must take inspiration both from these « centres of excellence » of his prestigious past and of the most prestigious and efficient « centres of excellence » of the modern leading countries in America, Europe and Asia.
- According to the pitiless Darwinian law of evolution applied to nations, the salvation and the survival of African nations depends only on their hability to renew with the « culture of excellence » through the « scientific, technologic and economic renaissance » dreamed by Tambo Mbeki and sckeched by NEPAD program.
- According to the acceleration of history due to the merciless competition of globalization, Africa could hope his savation only if it feel itself enough stimulated by the irresistible rising of emerging continental size countries like China, India and Brezil, in order to achieve the dream of the African Union which is the United States of Africa, after renewing with its Ancient Egyptian past, beyond the parenthesis of the Arabic and European slavery trades and the European colonization, telling itself with Barack Obama « Yes we can, for we already did ».

3. INSTITUTES FOR EXCELLENCE IN ARTS, SCIENCES AND TECHNOLOGIES

Introduction

In his opening lecture yesterday, The Commissar of African Union for Human Resources, Science and Technology, Professor Jean-Pierre Ezin announced us the current joint project on which are working the African Union Commission and the department of education of UNESCO, conc Pan African Universities, on the model of United Nation Universities.

More precisely, the introduction of the document « Establishing Pan African University, Project Summary Report, June 2009 » says : « The African Union is deeply aware of importance of Universities in the attainment of its vision of peace, integration, prosperity and peerage in the global economy; through its NEPAD philosophy...It is proposed that one way of achieving such rationalization is through a network of differentiated Pan African university Networks. Under the area of higher education, the Plan of Action of the second decade of Education in Africa, the Consolidated Plan of Action (CPA) and the Action Plan for the Joint Strategy UA-UE call for enhancing collaboration among institutions of higher learning and research, enhancing links with industry as well as identification and strengthening of networks of Centers of Excellence to enhance the capacity of africa to contribute to the global pool of knowledge and innovation. »

But, beyond the present most prestigious universities in the world like Harvard, MIT, Berkley, Oxford, Paris 6, Orsay, Mosou State University, Tokyo University, every body in this assistance knows that the most prestigious and efficient « Centres of Excellence », playing the role of catalyst in the chemistry and more precisely the alchemy of « excellence in Arts, sciences and technologies », are research institutions of modern leading countries like :

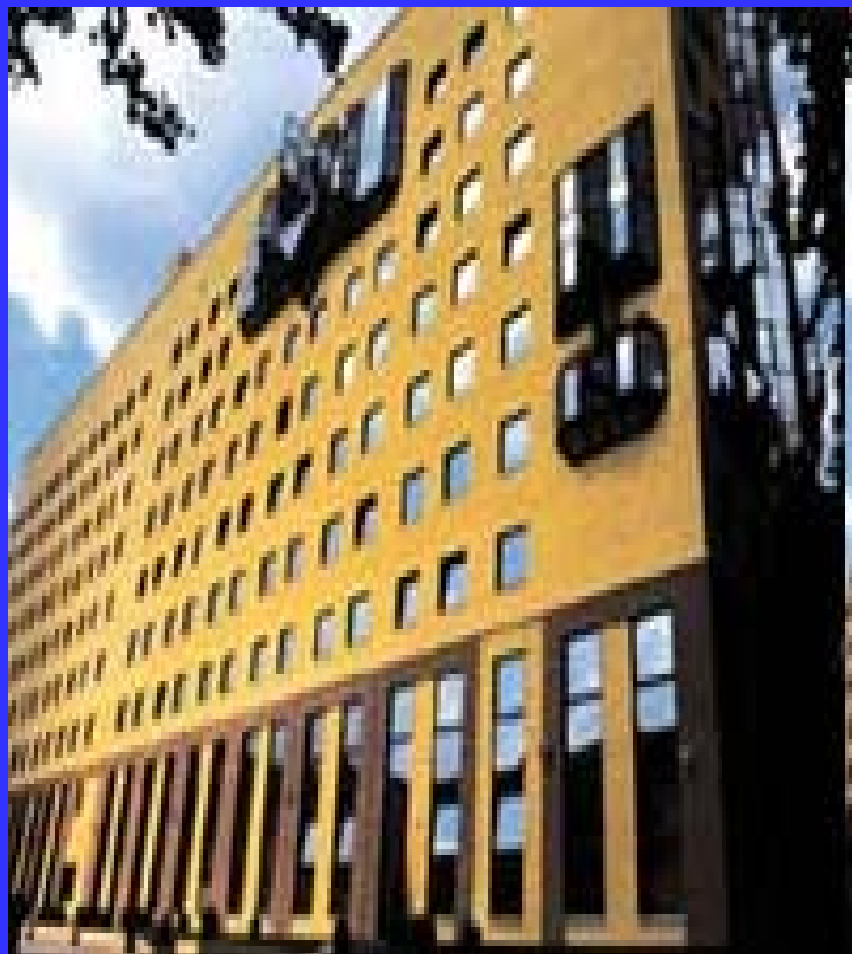
The Institute for Advanced Studies of Princeton (IAS)



Created in 1930

Its emblematic members who founded its exceptional reputation are : Albert Einstein, Kurt Gödel, John Von Neuman, Robert Oppenheimer and André Weil

Steklov Mathematical Institute of Moscow



Created in 1932
after the scission of an
Institute of Mathematics and
Physics created by Steklov
in 1921

Its present emblematic
members are :

Igor Shafarevich,
P. Novikov,
Yuri Manin

Tata Institute of fundamental Research of Bombay



Created in 1945

Composed presently
with a :

School of Mathematics

School of Natural
Sciences

School of Thechnology
and Computer Science

Max Planck Institutes



Created in 1948

Composed presently with more than 80 decentralized Institutes, among which an :
Institute for Mathematics at Bonn

Institute for Physics at München

Institute for Informatics in Saarbrück

L'Institut des Hautes Etudes Scientifiques (IHES)



Created in 1958 with the assistance of Robert Oppenheimer and Jean Dieudonné.

Its emblematic members who founded its reputation are :

Alexandre Grothendieck
Jean Dieudonné

Research Institute for Mathematical Sciences (RIMS)



Created in 1963 within
Kyoto University.

Its present emblematic
members who are :

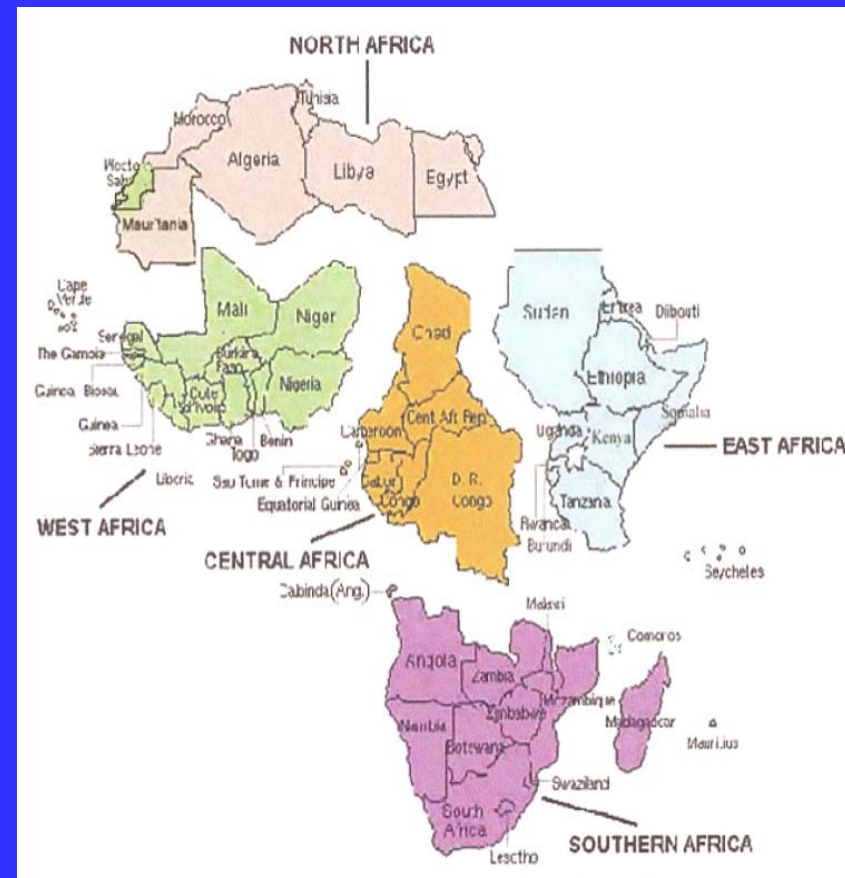
S. Mori,

M. Kashiwara,

M. Kawai

Our first proposal : Creation of Institutes for Excellence in Arts, Sciences and Technologies in relation with Pan African Universities

Since our conference is a brain storming to strengthen basic sciences in developing countries, in particularly in Africa, let us suggest to the African Union Commission and UNESCO to enrich and strengthen their project of a network of Pan African Universities in each of the five regions of Africa by associating to each Pan African University on the model of Ancient Egypt Excellence Centres, on the model of the decentralized Max Planck Institutes and of the model of the double structure of the Institute of Advanced Studies and the University of Princeton, an ambitious « Institute for Excellence in Arts, Sciences and Technologies », in accordance to the African wisdom sentence « It is on the model of the ancient rope that the new one is twisted ».



Missions of the Institutes for Excellence

The first mission of such an « Institute for Excellence » should be to boost both fundamental and applied researches in basic sciences by the teachers and researchers of the Pan African Universities, by being for all the departments of each Pan African University what the locomotive is for the cars of a train and what a catalyst is for a chemical reaction.

- *The second mission should be to invest the intelligence of the members of the « Institute for Excellence » into winning strategies to be also a powerful motor of the « economy of knowledge » in favour of the global economy of Africa on the model of emerging economies of China and India, in assistance to the Pan African Universities, in accordance with African Union Commission conception of Pan African Universities stated as follows in the introduction of the cited AU document :*
- *« The Pan African University aims to promote Science and Technology on the continent and link scientific research to economic development. It will enhance universities triple mission of education and training; research; and public service or assistance to the African community »*

4. INTERNATIONAL SUMMIT ON THE ECONOMY OF KNOWLEDGE IN AFRICA

Introduction

The speed of Japan's economic and industrial growth from the end of the second world war, and the speed of the same present growth for China and India for a decade, mainly in the field of data processing for India, confirm that we already left the « industrial era » to enter the « post industrial era » or the « knowledge economy era », where technological innovations, like computers, email, mobile phones, became the motor of economical growth and where intelligence is more and more demanded.

The challenge, which Institutes for excellence could efficiently contribute to take up in Africa, consists for winning firms in exploiting cleverly the mines of « scientific knowledge » and of « technological know-how », in order to « convert intelligence in ingenuity and ingenuity in technology », thanks to research and development activities, which need competent and motivated human resources, with an adequate initial and continuous education.

Africa is presently far away from this challenge of intelligence, ingenuity and technology, although the products of challenge coming from abroad are coveted and consumed with avidity every where in Africa, non only by african elites, but also by urban and country masses, like for tv with satellite dishes, mobile phones or internet. With this situation, African societies seem condemned to a statut of miserable parasites, consuming more and more what they are less and less able to produce.

Our second proposal : an international summit on the economy of knowledge in Africa

In front on this dangerous and degrading economical position of Africa, it is a moral and urgent obligation for all those who are in charge of African Nations or Institutions, epecially for the commissar of Human Ressources, Science and Technology of African Union, to organize as soon as possible, under the leadership of African Union Commission and other international economic institutions like the United Nation Economical Commission for Africa, of a foundation educational and economic summit on "economy of knowledge in Africa", to start up the "innovation economy" and "innovation companies" on the African continent as on the Asiatic continent, and to power both the "global economy in Africa" and the fundamental and applied researches in basic sciences in Africa.

5. ON LINE NETWORKS OF RESEARCHERS AND THESIS STUDENTS IN MATHEMATICS

Our last Proposal

By lack of time, to conclude our brain storming, let us just formulate our last proposal motivated by our personal rich experience on the matter : according to the specificities of research in mathematics, it would be efficient for the strengthening fundamental and applied research in mathematics and a contribution to solve the problem of critical mass of African researchers and the training of future leaders in teaching and research in mathematics, to strengthen and to create on line networks of researchers and thesis students in mathematics, in favour of African mathematician and open to interested non African mathematicians.

These networks, under the auspices of an international or academic institution, should be granted with adequate electronic, administrative and financial means, like individual and portable virtual libraries, on line access to rich libraries of great mathematical institutions, personal and community tele conference meetings, real mathematical meeting, etc.

No to waist time, I'm ready to start an « on line network in algebra and algebraic geometry » in favour of researchers and thesis students of universities of Porto-Novo in Benin and Lomé in Togo, after discussion at the beginning of our conference with my colleague the head of the Institute of Mathematics of Porto-Novo and the discussion two weeks ago with these colleagues of department of mathematics of Lomé university, it remains only to solve means problems. So, we are open to any offer of such means.

*Merci
pour toute votre
attention !*