



Below are transcribed speeches from a forthcoming book-in-progress:

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The corresponding [video](http://emeagwali.com) for each speech is posted at emeagwali.com.

Regards,

I Speak for Africa

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Philip Emeagwali

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Africa Can Leapfrog into the Information Age

by [Philip Emeagwali](#)

Seventeen African nations celebrated the 50th anniversary of post-colonial rule in 2010. What lesson did Africa learn from its years of colonization? The answer is that nations that control critical technologies rule those that purchase them.

Consider the invention of the compass, the key technology that made it possible to sail across the Atlantic Ocean—from Europe to Africa to America—which, in turn, spawned the Atlantic slave trade that began in Africa on August 8, 1444. That trade was more devastating than the Arab slave trade that predated it by a thousand years.

That slave trade covered four continents and lasted four centuries. It began with the invention and control of one

critical compass technology, which, in turn, led to one in five Africans resettling in the Americas. It resulted in 200 million Africans—uprooted to the Americas—losing their language, culture, and identity.

It was Britain's superior maritime technology that enabled it to colonize one quarter of the world. A century ago, the Union Jack's shadow reached across every single time zone on the planet, giving rise to the saying, "The sun never sets on the British Empire."

Before the compass was invented, Timbuktu (Mali) was as developed as Paris. Ten centuries before Christopher Columbus set sail for the Americas, Timbuktu was ahead of New York and on a par with London in terms of intellectual capital. Timbuktu loomed large in the European imagination as one of the most mysterious and remote places on Earth. An ancient West African proverb puts it in perspective:

"Salt comes from the north, gold from the south, and silver from the country of the white man, but the word of God and the treasures of truth are found only in Timbuktu. "

Timbuktu's downfall was that it failed to control critical technologies needed to defend itself against Moroccan invaders and to sail to Europe and the Americas. Hence it lost its treasures of wisdom and America, once behind Timbuktu, is now the motherland of technology.

Ironically, science and technology are the gifts of ancient Africa to our modern world. The first technologist known by name was an African called Imhotep. He is considered the father of medicine. The first mathematician to be known by name, Ahmes, was also an African. Ahmes authored a mathematics textbook 3,700 years ago. Yet, an alien at a modern day science conference would think there are no blacks on our planet.

The rise and fall of Timbuktu holds an important lesson for modern Africa: Men and women of wisdom are shining torches in our darkness; they are the torches that will guide us out of our ignorance. This was stated in different ways by the greatest intellectual giants Africa has produced. Nnamdi Azikiwe declared: "Show the light

and the people will find the way.” Kwame Nkrumah said, “Socialism without science is void.”

Technology will allow Africa to do more with less, and to do so without depleting its natural resources. The future is for us to create; but first we must outline our vision. The revenues of the future will be derived through the technological innovation of present generations. Africa must innovate or Africa will perish.

I say, “Democracy without technology is void.” Looking forward to another 50 years of democratic Africa, I see the cellular phone, the computer, and the internet enabling Africa to replace selection with election. I see the internet enabling citizens to become reporters and thereby decentralizing the media. I see technology enabling freedom of the press and democracy in Africa. I see Africa rising to great heights, not because of its natural resources, but because of its unsurpassed technological knowledge and the wisdom of its people.

When Africa’s natural resources are depleted, its people must make the transition to a technology-based economy. A long time ago, a man asked his children,

“If you had a choice between the clay of wisdom or a bag of gold, which would you choose?”

In human history, a nation that is second to none in technology is second to none in economy. The seeds for the wealth of tomorrow are the discoveries, inventions and innovations—the new clays of wisdom—made today. Africans can make Africa—and the world—a better place by using technology to leapfrog Africa into the Information Age.

[Philip Emeagwali](#) was described as “one of the great minds of the Information Age” by former U.S. President [Bill Clinton](#).



[Philip Emeagwali](http://emeagwali.com) [emeagwali.com]

Africa Must Innovate or Perish

– Part 5 of 5

by [Philip Emeagwali](#)

Excerpt from Nigeria's 50th anniversary lecture at the Embassy of Nigeria, Paris.

Lecture video and audio are posted at

<http://www.youtube.com/watch?v=mxU-izhbEWI>

and emeagwali.com.

Nigeria has approximately a 50-year supply of oil if no new oil is found. In a world without oil, the cutlass will replace the farm tractor. We know most oilfields have been discovered and that oil exists in limited quantities. We know that oil wells dry up after 50 years. Rather than debate the exact year when Nigeria will run out of oil, I prefer to imagine we've already run out. The arrival of that day is as certain as the death of the Oloibiri oil well.

If Nigeria's oil well number one is empty and abandoned, what will be the fate of its oil well number one thousand?

It may come sooner than any of us expect. Our heirs will thank or curse us for the amount of oil we leave for them.

Scientific discoveries lead to technological inventions and are the foundations of knowledge: the knowledge that must precede the development of new products, services, industries, jobs, and new wealth.

In human history, technological development and economic growth have gone hand-in-hand. A nation that is second to none in science is second to none in economic power. The grand challenge for African scientists is to make discoveries and inventions that can be domesticated and diffused into the continent's economy.

It's innovation and technology that create new products, which, in turn, create new wealth that alleviates poverty. For every ten gallons of oil in our oilfields, only three can be recovered. My discovery that an internet can solve physics problems by sending and receiving answers via emails is one of the innovative tools, techniques, and

technologies used to recover maybe one percent of the remaining seven.

In 1989, while solving one of the 20 grand challenges in supercomputing, I broke world records in computation and communication. It garnered international headlines and I, the mathematical storyteller, became both the story and the witness.

I broke those records by reprogramming and reinventing an internet comprised of 65,000 subcomputers to compute and send and receive e-mails to and from 65,000 unique e-mail addresses and to solve 24 million equations, each restating the laws of physics at a world-record speed of 3.1 billion calculations per second.

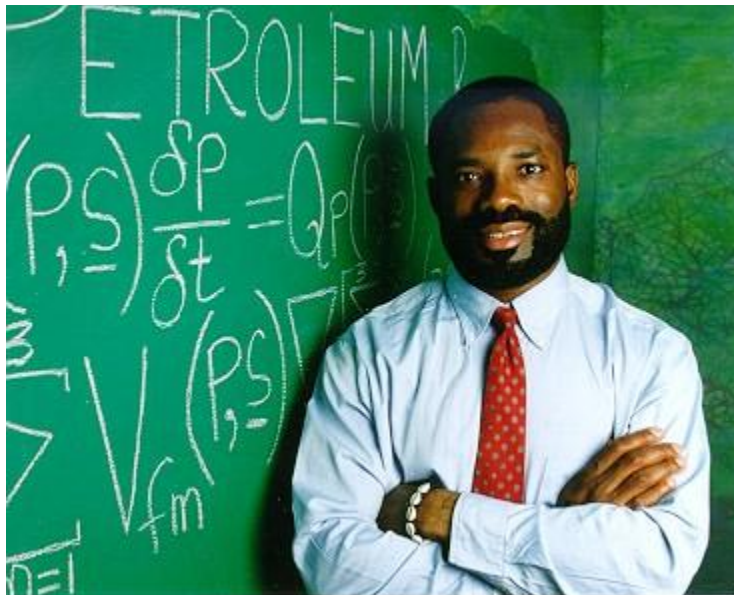
My belief is that a scientist has to be more than a witness; he or she must be a person of ideas, in constant search of better rules. There is always room for better rules.

I reformulated and reduced Newton's Second Law of Motion to 18 equations and algorithms, the

mathematical lyrics of the Earth. My discovery of those equations and algorithms was front page news.

One day I received a phone call from an American mathematician working in Germany who had read about my discoveries in the *Wall Street Journal* in June of 1990. I explained to him the grand challenge equations I invented and solved. I said to him:

"At its physicalized core, three of the six primitive partial differential equations of meteorology used to forecast today's weather are the same as the nine equations I invented for recovering more oil from oilfields and are the same as the Navier-Stokes equations."



[Philip Emeagwali](http://emeagwali.com)

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It was an "aha" moment for him. He bombarded me with technical questions. I answered:

"They are the same because they emanated from the Second Law of Motion of physics. They're calculus restatements of the Second Law which, in turn, are restated as the simple algebraic equation: Force equals Mass times Acceleration or $F=ma$."

He became excited and pleaded with me to give a lecture in Washington, D.C. on July 8, 1991 at a session he was chairing at an international congress of applied mathematicians, held once every four years. The ten thousand attendees comprised the largest gathering of the Who's Who in mathematics.

I attended but I was dismayed and said to myself: "The first mathematics textbook was authored 3,700 years ago by an African named Ahmes. Yet, an alien at this conference would think they are no blacks on our planet."

I am often asked to share my visions of the future and to predict how the internet could be used to solve Africa's problems and create new possibilities for its people. My answer is that the internet will accelerate globalization even more and transform Africa, and that in the globalized world of the twenty-second century, there will be more Africans outside Africa than inside. Lagos will become an international metropolis and Africans will abandon their traditional clothing, cuisine, and cultural markers, becoming no more African than the black American. Many Africans in Africa will have a mixed racial heritage, like that of Barrack Obama.

While I predict this trend, I also question it. Is it progress for Africa to lose that which makes it unique? Ironically, developing a better technology also Europeanizes the African identity through globalization. A similar historical example can be found in the invention of the compass, which made it possible to sail across the Atlantic Ocean. This spawned the devastating Atlantic slave trade, which began in Africa on August 8, 1444.

It covered four continents and lasted four centuries. It forcibly uprooted millions of Africans to the Americas. It stripped Africans of their language, culture, and identity. It led to the African diaspora, with one in five Africans resettling in the Americas.

The future is for us to create, but first we must outline our vision. Foot soldiers, not generals, will lead our war against ignorance. The foot soldiers are our one hundred million young Nigerians whose weapon is knowledge. Their collective intellectual capital will enable them to build a stronger Nigeria using technology.

My 50-year vision for Nigeria to tap into the creativity of our young people. They have the potential to uplift humanity. Technology is all around us and we are constantly inventing and reinventing new tools, techniques, and technologies. That journey of discovery to the frontier of science reaffirms humanity's goal to endlessly search for new knowledge, and to demand more of itself. Let's do the best we can to make the world a better place through technology.

Philip Emeagwali has been called “a father of the Internet” by [CNN](#) and [TIME](#), and extolled as a “Digital Giant” by [BBC](#) and as “one of the great minds of the Information Age” by former U.S. President Bill Clinton.



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Oil Tanks Exhausted, Think Tanks Needed

—Part 4 of 5

Can Africa Leapfrog into the Information Age?

By [Philip Emeagwali](#)

Excerpt from Nigeria's 50th anniversary lecture at the Embassy of Nigeria, Paris. Lecture video and audio are posted at <http://www.youtube.com/emeagwali#p/a/u/1/d1mCIXleezY> and emeagwali.com.

The man with wisdom is a shining torch that sheds light in our darkness and guides us out of our ignorance. I am often asked: "How do we build a stronger Nigeria through technological innovation?"

I came across the answer in 1963 sitting on the verandah of our house along Gbenoba Road, Agbor, Midwest Region. I was silently reciting a quotation on the masthead of the newspaper called the *West African Pilot*. It read:

"Show the light and the people will find the way."

Because I was nine years old, I did not understand the deep meaning of those wise words. I now understand “the light” as a metaphor for knowledge, and “showing the light” to mean increasing the intellectual capital, the sum of human knowledge possessed by 6.6 billion men, women, and children. We find “the way” when we’ve brought to fruition our dream of eradicating poverty, discovering the cure for AIDS, and inventing the internet for email communication.

A long time ago, a man asked his children,

“If you had a choice between the clay of wisdom or a bag of gold, which would you choose?”

“The bag of gold, the bag of gold,” the naïve children cried, not realizing that wisdom had the potential to earn them many more bags of gold in the future.

The wealth of the future will be derived from developing the intellectual capital—the clay of wisdom—and the innovations of the younger generation to make Nigeria stronger.

Should Nigeria migrate from oil to soil, as is often suggested. I think not. It should leapfrog into the Information Age. Nigeria cannot return to an agricultural age because the West is being



A circa 2007 photo of Gbenoba Road.

This is a circa 2007 photo of Gbenoba Road where I lived from mid-1963 to late 1966. We later moved to the nurses quarter of the General Hospital, Agbor. In our living room parlour, my father, James, made me solve 100 maths problems an hour from an arithmetic textbook published by Longmans. I played soccer along the dusty (then untarred) pathways off this street. My classmate, Isaac Omoille, taught me how to ride my father’s Raleigh bicycle on this street. I walked along this street to Saint Philip’s Primary School and its Roman Catholic Church.

urbanized, the East is being eroded, and the North is being desertified. A Nigeria without oil must make the transition to a knowledge-based economy. Nollywood can redefine 21st century Africa as the continent of arts and innovation.

If Nigerians have an average of three children per couple, it will become the world's third most populous nation in 50 years. It will lag behind China and India, but will have a greater population density.

Where will we find farmland? My grandfather's farmland was located where Onitsha market now lies. For countless centuries, my Igbo ancestors were farmers. Sons walked in their father's footsteps, ploughing the same land. Their life expectancy was about 37 years.



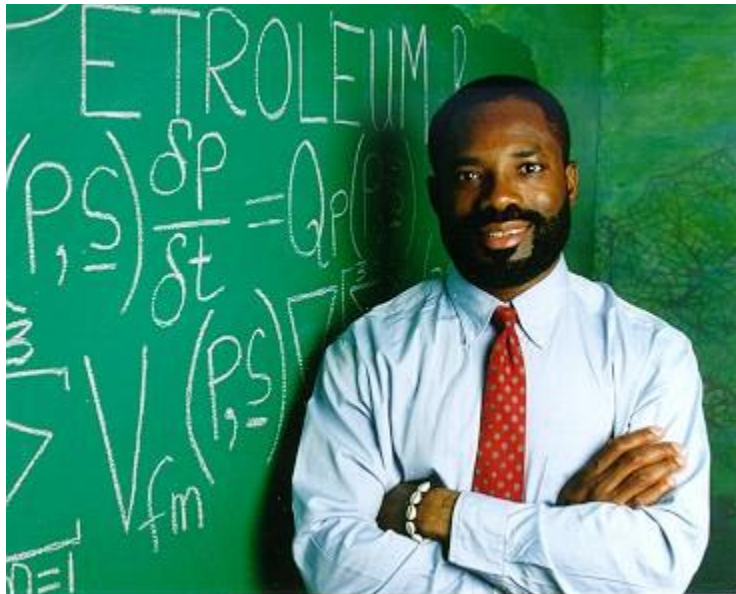
My maternal grandmother Mrs. Obam Balonwu (*nee* Okudo) was a farmer. She was born in Nkwelle Ogidi in about 1900 and passed away on December 24, 1966.

This photo was taken at 6C Wilkinson Road, Onitsha, circa 1955, during the ceremony of her initiation into the *Otu Odu* (Ivory Society), the most prominent women organization in Onitsha.

Daughters married early, had as many children as they could, and became young widows. My mother married days after her 14th birthday and gave birth to me six days after her 15th birthday. She was born in colonial Africa, where she counted her age on her fingers and toes and by her age-grade affiliation.

Yet she had a son who could count the ages of humanity on his supercomputer, which occupies the space of four tennis courts. Her son's supercomputer computes and communicates as an internet and sends and receives answers via e-mails to and from 65,000 sub-computers.

My father and I, followed by my son, broke the tradition of walking in our ancestors' footsteps. My father was a nurse, and my son and I are computer scientists. All three of us abandoned the soil to work in knowledge-based industries.



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A Nigeria Without Oil

– Part 3 of 5

By [Philip Emeagwali](#)

Excerpt from Nigeria's 50th anniversary lecture at the Embassy of Nigeria, Paris. Lecture video and audio are posted at http://www.youtube.com/emeagwali#p/a/u/0/1BqefTrj_7Y and emeagwali.com.

I wish to look back to 1960, and forward to 2060, to share my thoughts about the challenges to, and opportunities for, building a stronger Nigeria through technology. In the past 50 years, Nigeria has grown economically stronger through its use of technology to discover and then recover petroleum. Fifty years ago, Nigeria had only one oil well. Fifty years later, that first oil well is empty and abandoned. Do the math: "How many oil wells will Nigeria have left in 50 years?"

Empty oil wells are not abstract, intangible things. They're as concrete as Nigeria's first oil well: the Oloibiri well, that now exists only on postcards. *We treat our oil wells like we treat snails: We take the flesh and leave the shell. And we leave the shell for our children, and they*

leave it for their children, who will earn income by converting it into a tourist attraction.

Fifty-year-old oil wells are drying up everywhere, from Nigeria to Saudi Arabia to Russia. Perhaps in 50 years, Nigeria will no longer be one of the twelve members of the Organization of Petroleum Exporting Countries.

Our petroleum was formed millions of years ago, when our pre-human ancestors crawled on four legs. And today we've discovered nearly all the oil that can be discovered. Yet Nigeria's future is being written by its few oilfields. Oil revenues account for 80 percent of Nigeria's budget. The nagging question is: What will we do when that 80 percent is gone? What is our Plan B when our Plan A fails? Searching for more oil is not the answer.

These are tough questions that we prefer to ignore but our children must answer. To prepare our future leaders for "a world without oil," I advise newspapers and schools to sponsor essay competitions that ask,

"If you're an editor who's been informed that the last oil well in Nigeria has dried up, what headline would you use and what would you say in your editorial?"

I posed this same question to my friends and they e-mailed these headlines:

1. "The Goose is Dead."
2. "The End of Nigeria's Curse."
3. "Oil Tanks Exhausted, Think Tanks Needed."

I am forming a think tank that addresses futuristic questions, such as: "What are the challenges to, and opportunities for, a Nigeria without oil?" The answer lies within the soil of our minds. If we do not understand our past we are bound to repeat our mistakes. Africa's history is more than dusty facts and faded images.

Once upon a time, West Africa was on par with Europe in terms of intellectual capital and development. Ten centuries before Christopher Columbus set sail for the Americas and Mungo Park sought the course of the River Niger, Timbuktu loomed large in the European imagination as one of the most mysterious and remote places on Earth. Timbuktu, which emerged from the

River Niger, was a metaphor for the end of the ancient world.

Timbuktu was great not because of its petroleum reserves, but because of its unsurpassed intellectual capital and the collective knowledge and wisdom of its people. Nigeria will join the world's top 20 economies, not because of its petroleum revenues but through the technological knowledge of future generations.

For Nigeria to join the top twenty economies, it must turn its brain drain into brain gain. As a center of intellectual excellence, Timbuktu attracted the best brains and inspired the ancient West African proverb:

"Salt comes from the north, gold from the south, and silver from the country of the white man, but the word of God and the treasures of truth are found only in Timbuktu. "

For Nigeria to build the Timbuktu of tomorrow and become a top twenty economy, it must control critical technologies, and not merely purchase them. It must turn its brain drain into brain gain. Nigeria needs men and women of ideas, technological visionaries and futurists,

to help its people answer the larger question of who they are, where they've been, and where they want to go.

It was Britain's superior maritime technology that enabled it to shape Africa's destiny with over 500 years of slave trading and colonization. Slave trade led to brain drain needed for growth while colonization yielded brain gain that increased development.

While the United States was beginning to profit from the brain drain flowing from Europe and Africa, Timbuktu was being physically and intellectually sacked by Moroccan invaders and slave traders from the Americas. Timbuktu lost the human capital needed for growth and development and never recovered as a center of intellectual excellence.

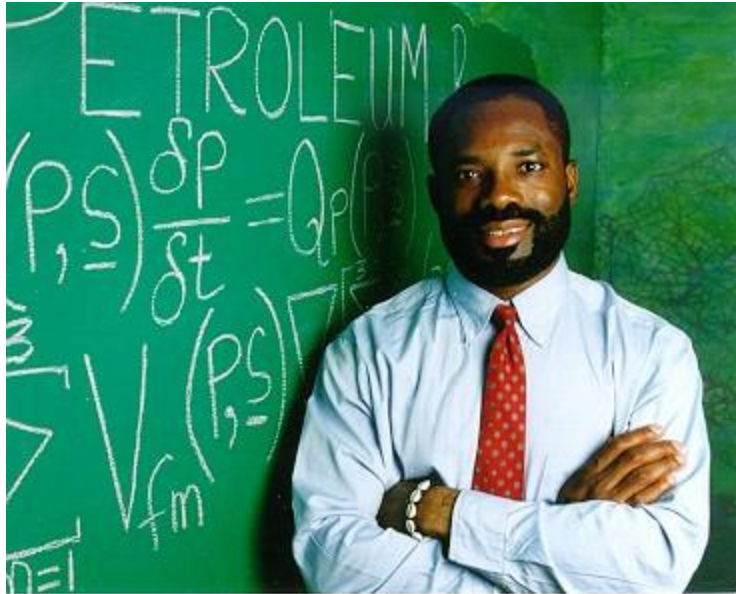
Technology will allow Nigeria to do more with less, without depleting its natural resources, but with greater reliance on technology. The future is for us to create, but first we must outline our vision.

Foot soldiers, not generals, will lead our war against ignorance. The foot soldiers are our 100 million young Nigerians whose weapon is knowledge. Their collective

intellectual capital will enable them to build a stronger Nigeria using technology knowledge. My 50-year vision for Nigeria is to tap into the creativity and innovation of our young people. Our young people have the potential to uplift humanity.

Technology is all around us and we humans are constantly inventing and reinventing new tools, techniques, and technologies. Our journey of discovery to the frontier of science reaffirms humanity's goal to endlessly search for new knowledge, and to demand more of itself and its people.

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[Philip Emeagwali](http://emeagwali.com)

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Memories of Colonial Africa

– Part 2 of 5

By Philip Emeagwali

Excerpt from Nigeria's 50th anniversary lecture at the Embassy of Nigeria, Paris. Lecture video and audio are posted at <http://www.youtube.com/emeagwali#p/a/u/1/ulb-ZyZi2BY> and emeagwali.com.

I was born in 1954 in colonial Africa. One of my most cherished mementos from the colony of Nigeria is one of the pennies I received for my school lunch allowance. The coins bore the likeness of Edward VIII, who became King of England on January 20, 1936, and were minted in anticipation of his reign. However, Edward abdicated the throne on December 11th of that year before he could be crowned. He gave up the British kingdom to

marry the love of his life, an American divorcee.

In 1960, a typical day in my life began at our compound on Yoruba Road, in Sapele. Our compound was adjacent to the Eagle Club, a night club where I ran errands for music legends, such as master trumpeters E.T. Mensah, Eddy Okonta, and [Zeal Onyia](#). They would give me a penny to buy two sticks of cigarettes and I would bring back their half-penny change.

I'm the physicist and the mathematician who told a story in which a new technology came alive through three boards: a storyboard, a blackboard, and a motherboard.

Looking forward 50 years, I foresee that nations delivering information and communication technologies will indirectly rule Africa.

I lived here, adjacent Eagle Club,
from 1958 to 1962

The little boy stands in front of my
former room-and-parlour
residence. (Yoruba Road, Sapele,
Nigeria. Photo taken on 11-29-00)



Some mornings, my mother would give me a penny with the instructions: "Buy rice with a

farthing, beans with a farthing, and bring back a half-penny change."



My mother Mrs. Agatha Iyanma Emeagwali (*nee* Balonwu) is second from left. Photo taken with her distant relatives. Mrs. Ifejika (*nee* Oranye of Umuasele Village of Onitsha), Ms. Orakwue (of Umudei Village, Onitsha), Ms. Nwaosisi (Umuasele Village, Onitsha). Photo taken in Forcados, Nigeria in about May 1958.

I am the artist that told stories about how the Laws of Motion gave rise to the eternal truths of calculus; timeless truths that will outlast the changing opinions of all times... and my reinvented algorithms became my fingerprints on the sands of time.

When I told this story to my son, Ijeoma, he interrupted, saying, incredulously "Daddy, you can't get change for a penny!" I then show him my souvenir: a British West African central-holed coin, bearing the head of King George V and minted in 1936 with the inscription "one tenth of a penny." The central hole was for stringing the coins together, to carry them. The world has changed greatly since my youth!

Nigeria has existed for 96 years and has been independent for 50 years. Nigerians must look back to the first 46 years, spent under colonial rule, to understand the 50 post-colonial years of their self-rule. Looking backward, like the Sankofa, is a prerequisite for understanding the way forward.

With self-rule came responsibility. We're now being held accountable for our actions and inaction, our coups and corruption, and our civil wars in Biafra, Congo, and Rwanda.

Looking backward 96 years will enable Nigeria to understand when and where it's train derailed and how to put it back on track. I believe our train derailed because, although the 46 pre-independence



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years were a brain-gain period, the 50 post-independence years have been marked by the largest brain drain since the Atlantic slave trade.

Looking forward 50 years, I foresee that nations delivering information and communication technologies will indirectly rule Africa. I see the cellular phone, the computer, and the internet enabling Africa to replace selection with election. I see the internet enabling citizens to become reporters, decentralizing the media. I see technology enabling freedom of the press and democracy in Africa.

Kwame Nkrumah said, "Socialism without science is void." I say, "Democracy without technology is void."

A scientist can be famous yet remain unknown. The grand challenge for scientists is to focus on discoveries that reduce poverty rather than on winning prizes. To focus on the prizes we have won, instead of the discoveries we have made, would be akin to dwelling

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on a hero's medal and ignoring his heroism.

Discoveries and inventions that increase wealth and reduce poverty are the "heroes" of science and technology and one hundred nations have printed their revered scientists' likenesses on their currency. This elevated those scientists as exalted bearers of their people's best vision of themselves.

Please allow me to answer a question I was asked: What did I contribute to science and technology? I reformulated and solved nine partial differential equations listed in the 20 Grand Challenges of computing.

The equations I invented are akin to the iconic Navier-Stokes equations listed in the Seven Millennium Problems of mathematics. Those Seven Millennium Problems are to mathematics what the Seven Wonders of the World are to history. To be accurate, the equations I solved were not exactly solvable, but were computably solvable. That is, I

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digitally solved the grand challenge version, not the millennium one that must be solved logically.

A novelist is a storyteller, and a scientist is a history maker. A novelist creates a fictional world, but [a scientist discovers factual stories about our universe](#). I am an internet scientist who discovered factual stories. I reprogrammed and reinvented an internet to tell 65,000 factual stories to as many sub-computers.

The internet—meets humanity's fundamental need to compute and communicate—and spreads like bush fire, and resonates decade after decade, and maybe century after century. The internet is a technology that both connects people and connect with people in a way that will forever remain deep and enduring.

I am the artist that told stories about how the Laws of Motion gave rise to the eternal truths of calculus; timeless truths that will outlast the changing opinions of all times. My restated Second Law of Motion became my footprints;

my reformulated partial differential equations became my handprints; and my reinvented algorithms became my fingerprints on the sands of time.

I'm the physicist and the mathematician who told a story in which a new technology came alive through three boards: a storyboard, a blackboard, and a motherboard.

My story has been retold from boardrooms to newsrooms, from classrooms to living rooms. It all began as a dialogue between a supercomputer programmer and his 65,000 sub-computers, which he reprogrammed as an internet.

During a conversation conducted in the languages of physics and mathematics between me and my machines, in 1989, I performed a world record of 3.1 billion calculations per second: This occurred when my keyboard replaced the handwriting on my blackboard and bridged the gap between man and motherboard. I became known for my discovery that a supercomputer is an internet and vice versa, and I, the

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storyteller, became both the story and the witness.

My journey to the frontier of knowledge did not begin in America. It began in 1960 in Colonial Africa.

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A novelist is a storyteller, and a scientist is a history maker. A novelist creates a fictional world, but [a scientist discovers factual stories about our universe.](#)

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<http://www.youtube.com/watch?v=4Nxi4YRIAxI&feature=related>

<http://www.youtube.com/watch?v=4Nxi4YRIAxI>

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EDDY OKONTA

http://www.youtube.com/watch?v=7_QoMDG7t30&NR=1

<http://www.youtube.com/watch?v=9WXKMR6PaKs>

E.T. MENSAH

<http://www.youtube.com/watch?v=9m1TaPgQ14k>

<http://www.youtube.com/watch?v=CSc7C4sf2P0&feature=related>

E.T. Mensah performed at the Eagle Club, adjacent to my family compound.



AFRICA: Then, Now and Forever

– Part 1 of 5

By [Philip Emeagwali](#)

Excerpt from Nigeria's 50th anniversary lecture at the Embassy of Nigeria, Paris. Lecture video and audio are posted at http://www.youtube.com/emeagwali#p/a/u/2/6_mrjx2UIO8 and emeagwali.com.



Nigerian children welcome Queen Elizabeth II to Lagos, Nigeria.

Walk with me in memory to one of the greatest celebrations, the end of the colonial era in Africa. The day: October 1, 1960. The place: British West Africa. The setting: a crowded stadium in the Atlantic coastal town of Sapele. School children are waving green and white flags in honor of the birth of modern Nigeria, no longer part of the British Empire.

I was six years old and was in that stadium. I do not remember what

was said because the concept of colonialism was abstract to me. But I vividly remember an incident that made me cry all that day. I was waving my flag in excitement when a faceless bully snatched it away and disappeared into the crowd.

In far-away Lagos, the Union Jack was lowered. Nigeria's Head of State, the Queen of England, was dethroned and Nnamdi Azikiwe

In 1884 [Berlin Conference], Africa was the agenda, but no African was at the table.

became Nigeria's first black leader.



Fifty years earlier, the Union Jack had cast its shadow across every global time zone, giving rise to the saying, "The sun never sets on the British Empire." We had showed our pride in being part of the empire by celebrating Empire Day on May 24th, Queen Victoria's birthday, with parades and sporting competitions. Later, Empire Day was renamed Commonwealth Day.

As a country, Nigeria has existed for 96 years, but it has only been

independent for 50 years, for just over half that time. We must critically examine the 46 years of colonial rule over Nigeria and the scramble for Africa that began with the Berlin Conference of 1884, if we are to get insights into how to chart our nation's course for the next 50 years.

The Sankofa is a mythical bird of the Akan people of West Africa. It flies forward while looking backward, with an egg in its mouth to symbolize the future. In order to understand its history, to reclaim its past, and to enable its people to move forward into the 21st century, Africa must look back, back to the Berlin Conference of 1884 and back to the Atlantic slave trade that spanned four continents and four centuries. This will allow us to understand how we came to be 54 nations instead of one.

Like the Sankofa bird, Africa must look to its past to predict its future. It must know how it evolved in

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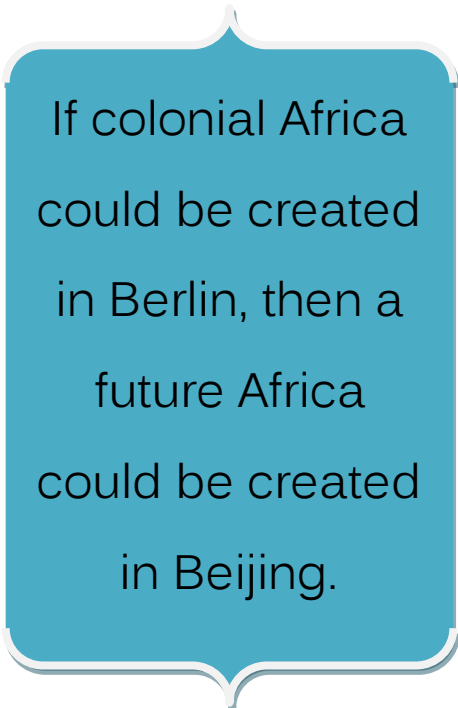
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order to understand how it can be recreated. Its people should know where their journey began in order to understand which direction to take to find their future.

The Berlin Conference is when Africa was divided into roughly 50 colonies, and 1884 was when the modern map of Africa was created. The Berlin Conference was the beginning of modern Africa. In 1884, Africa was the agenda, but no African was at the table.

This year, in 2010, 17 African nations are celebrating their 50th anniversary of sovereignty and post-colonial rule. Nigeria's journey, like that of the other independent African nations, began at the Berlin Conference 126 years ago with no African in attendance. If colonial Africa could be created in Berlin, then a future Africa could be created in Beijing. Nations creating technological knowledge are reinventing the future and recreating Africa.

I believe that, by the end of this century, one in two Africans will live outside Africa. I was asked: "Why did you live in exile from Africa for 37 years?" Put differently, "Why don't you deliver Nigeria's 50th anniversary lecture in Abuja, instead of in Paris?" I have never visited Abuja. But I am not at home



If colonial Africa
could be created
in Berlin, then a
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in Beijing.

in Washington, D.C., either.

I had an asymmetrical relationship with Africa and America, as well as with science and technology. I worked entirely outside the gates of science and as an outcast, with outsider status. I was honored, but will forever remain an outsider in

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America. I was honored for retelling the 330-year-old story of the Second Law of Motion: from the storyboard, to the blackboard, to the motherboard, by reprogramming 65,000 subcomputers to compute as a supercomputer, and to communicate as an internet. I became my own ancestor in physics, my contemporary in mathematics, and descendant in internet science.

I experienced the usual in an unusual way. I was an ordinary person caught up in extraordinary circumstances. I decided to march forward, to come home to myself, not to someone else's home. I stayed in exile in America, feeling at home in my alienation from the white community. My 37 years of solitude allowed me to gather myself and to find my power.

[Philip Emeagwali](#) has been called “a father of the Internet” by [CNN](#) and [TIME](#), and extolled as a “Digital Giant” by [BBC](#) and as “one of the great minds of the Information Age” by former U.S. President [Bill Clinton](#).



[Philip Emeagwali](http://emeagwali.com) [emeagwali.com]

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An Open Letter to Martin Luther King

by Philip Emeagwali

emeagwali.com

Walk with me down memory lane. The time: 1968. In 30 months, one million dead. The setting: a dusty camp in Biafra where survivors waited and hoped for peace. The survivors: Refugees fleeing from the “Dance of Death.” My mentor: One of the refugee camp directors, whom I called “Teacher” out of respect.

“Martin Luther King has been killed,” Teacher said, with a pained voice and vacant eyes. I looked towards Teacher, wondering: “Who is Martin Luther King?” I was a 13-year-old refugee in the west African nation of Nigeria, a land then called Biafra. Martin Luther King. What did that name mean?

Eight out of ten Biafrans were refugees exiled from their own

country. Two years earlier, Christian army officers had staged a bloody coup killing Muslim leaders. The Muslims felt the coup was a tribal mutiny of Christian Igbos against their beloved leaders. The aggrieved Muslims went on a killing rampage, chanting: “Igbo, Igbo, Igbo, you are no longer part of Nigeria!” In the days that followed, 50,000 Igbos were killed in street uprisings.

Killing was not new to us in Biafra. I was 13, but I knew much of killing. Widows and orphans were most of the refugees in our camp. They had survived the Igbo “Dance of Death” — a euphemism for the mass executions. One thousand men at gunpoint forced to dance a public dance. Seven hundred were then shot and buried *en*

masse in shallow graves. When told to hurry up and return to his regular duty, one of the murderers said: “The graves are not yet full.”

A few days later, with only the clothes on our backs, we fled from this “Dance of Death.” That was six months before Martin Luther King Jr. was assassinated. Teacher and I were eventually conscripted into the Biafran army and sent to the front, two years after our escape.

After the war, Teacher – who had taught me the name of Martin Luther King — was among the one million who had died. I — a child soldier – was one of the fifteen million who survived.

Africa is committing suicide: a two-decade war in Sudan, genocidal killings in Rwanda, scorched-earth conflicts in Ethiopia, Somalia, Uganda, and Liberia. The wars in modern Africa are the largest global-scale loss of life since the establishment of the Atlantic Slave trade, which uprooted and scattered Africa’s sons and daughters across the United States, Jamaica, and Brazil.

Africa’s wars are steering the continent toward a sea of self-destruction so deep that even the greatest horror writers are unable to fathom its depths. So, given our circumstances, Martin Luther King was a name unknown, a dead man among millions, with a message that never reached the shores of Biafra.

Neither did his message reach the ears of “The Black Scorpion,” Benjamin Adekunle, a tough Nigerian army commander, whose credo of ethnic cleansing knew nothing of Martin Luther King Jr.’s movement: “We shoot at everything that moves, and when our forces move into Igbo territory, we even shoot things that do not move.”

As we heed Martin Luther King Jr.’s call, and march together across the world stage, let us never forget that we who have witnessed and survived the injustice of such nonsensical wars are the torchbearers of his legacy of peace for our world, our nation, and our children.

Transcribed from speech delivered by Philip Emeagwali on April 4, 2008 at Morehouse College in Atlanta, Georgia at the commemoration of the 40th anniversary of Martin Luther King Jr.'s assassination. The entire transcript and video are posted at emeagwali.com.

Philip Emeagwali was inducted into the gallery of history's 70 greatest black achievers by the International Slavery Museum and into the Gallery of Prominent Refugees by the United Nations High Commissioner for Refugees.

###

Beyond the Last Computer

by Philip Emeagwali

emeagwali.com

I felt the hard, cold steel of a gun against the back of my head. I spun around and saw my assailant's finger shaking on the trigger: "Don't run or I'll shoot you," he said. I was just 14 years old, and death was a stranger to me.

It was 1969, and Nigeria was embroiled in civil war. As a teenage refugee conscripted into the Biafran Army, I was forced at gunpoint to carry weapons to the Oguta front. It was a 24-hour, march through mosquito-infested mangroves flooded by the River Niger.

When the 30-month war ended on January 15, 1970, I was discharged and reunited with my parents. Together with one million returning refugees we walked for three days, avoiding landmines along fetid rainforest footpaths. Eventually, we reached our hometown of Onitsha. It was badly

battered by the war.

There my thoughts returned to a love abandoned three years earlier—mathematical physics. This love affair blossomed when I was a refugee in Biafra, —shortly before July 20, 1969—the day man first walked on the moon. While running an errand, I stopped to gaze through a classroom window and saw a physics lecturer writing on a blackboard. It was Newton's Second Law of Motion: "Force equals mass times acceleration, or $F=ma$."

Unaware that I had just been introduced to the most important law in physics, I was, nevertheless, awestruck. Newton's Second Law of Motion is far more important than Einstein's Theory of Relativity. "E equals MC squared" may be sexier on a T-shirt than " $F=ma$," but *Encarta* lists the three laws of motion as the third most important

scientific discovery of all time.

Three hundred and thirty years later, we still do not completely understand $F=ma$. But it is the only formula that is integral to computing's 20 grand challenges and mathematics' seven millennium problems. I devoted many years devising a solution to one grand challenge. While conventional wisdom suggested it would be almost impossible to harness the power of 65,536 processors my grand challenge was to prove otherwise.

Initially, the challenge seemed deceptively simple; but in reality, there were so many different tiers of complexity that I sometimes forgot why I was programming those 65,536 processors. In hindsight, I did just about everything wrong before I finally got it right. Research is a high-risk game, but, as they say, nothing ventured, nothing gained.

The complexity of the grand challenge renders it as incomprehensible to laypeople as pages of hieroglyphics or Greek symbols. Concisely, the challenge

used the Second Law of Motion propagated along a virtual 16-dimensional hypercubic network to be executed by 65,536 processors. These processors are the beginning of the end. I started at the end because the end is devoid of the complex proofs and dense mathematical language that are unfathomable to non-mathematicians.

This grand challenge earned its name: it was a super problem that required one to think in ways that merge the laws of physics, logic, and numbers in 16-dimensional mathematical space, and to solve the problem by attacking it from three perspectives.

Walk with me as I tell a story that will take you from the Second Law of Motion to the blackboard, to the motherboard, to the mother of all motherboards: a one-of-a-kind computer powered by 65,536 processors. Every scientific discovery begins as a thought. The strategy for harnessing these laws of physics, logic, and numbers has to be conceived and thought out before becoming reality.

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I visualized the grand challenge problem as a complex game with complex parameters, which I solved using three simple rules. First, I harnessed the power of processors to perform myriad computations. Second, I followed a minimum number of communication pathways to perform a minimum number of communications. Third, I enforced the Second Law of Motion in models of all that flows underneath the Earth.

In all, I had 65,536 processors and over one million pathways. The processors-plus-pathways make a computer a supercomputer, and a planet-sized supercomputer an Internet.

I have been asked: “What gave you the confidence to tackle one of computing’s grand challenges?” My answer — fifteen years of putting into practice the athlete’s five P mantra: **P**roper **P**reparation **P**revents **P**oor **P**erformance.

In the 1980s, I was a mathematical physicist logged on 24/7 to a 65,536-brain supercomputer on think.com — the third registered

dot com ever. It was an unpaid labor of love. I was tormented by self-doubt, a maniac who pushed his supercomputer to its breaking point.

Each one of us must learn to move outside our comfort zones. We learn with each step we take into the unknown. When I was five, my father discovered that I was slow in mathematics. He decided to teach me to solve 100 math problems in one hour. Thereafter, my ability to do rapid calculations earned me the nickname “Calculus” and set me on the path to become a supercomputer scientist who solved one of the most difficult problems in mathematics.

Crossing the frontiers of knowledge to conquer tomorrow’s grand challenges will demand revolutionary techniques. In my new technique, my 65,536 processors perform computations side by side, linked by 16 wires, each corresponding to the 16 sides of a 16-dimensional hypercube. This is the essence of “higher” mathematics: go beyond

calculus and mine infinite dimensional spaces.

My multicolored drawings of the hypercube are a feast for the eye; programming them is a feast for the mind. The hypercubic circuitry of the supercomputer left me breathless. I was awestruck by its 16 unique information pathways coming from each processing node. Has there ever been any technology as gorgeously complicated as the hypercube supercomputer? For me, it was love at first sight. It was hypercubic elegance that engaged me emotionally, imaginatively and computationally.

One day, the Internet will become our shared planet-sized supercomputer and individuals will become nodes on the Internet and the Internet, as we know it, will become obsolete and “disappear” into our collective memory.

By definition, both the supercomputer and the Internet consist of connected nodes working in harmony. In fact, the

supercomputer is more about communication than computation. The supercomputer and the Internet link computation and communication into a congruent whole - two complementary sides of a coin.

As the computer evolves into the supercomputer, and the supercomputer evolves into the Internet, and the Internet evolves into humanity, all that will remain will be a HyperBall superbrain — an electronic, organic Web 10,000 miles in diameter encompassing the Earth. The nodes will be people, embedded in an interconnected network of humanity working as one.

If history repeats itself, the supercomputer of today will become the ordinary computer of tomorrow. This core technology could evolve to become iconic, a masterpiece, a legacy, a legend, and a contribution to civilization. Each new “grand challenge” met becomes another beacon guiding humanity forward into the age of information.

Transcribed from a [speech](#) delivered by [Philip Emeagwali](#) at The University of the West Indies, Trinidad and Tobago on June 8, 2008. The entire transcript and [video](#) are posted at [emeagwali.com](#).

[Philip Emeagwali](#) has been called “a father of the Internet” by [CNN](#) and [TIME](#), and extolled as “one of the great minds of the Information Age” by former U.S. President [Bill Clinton](#). He won the 1989 Gordon Bell Prize, the Nobel prize of supercomputing.

###

Technology Widens Rich-Poor Gap
Diaspora Showcase Africa
Tucson, Arizona
September 29, 2007

Oil has made us billions and fuelled our economic stability, but oil has also become the bane of our existence. For some, it is a curse that has caused poverty and corruption, but for others it is an essential source of untold wealth and power. But as the gap between rich and poor countries continues to expand, it is clear that intellectual capital and technology rule the world, and that natural resources such as oil, gold, and diamonds are no longer the primary determinants of wealth.

Surprisingly, nations with few natural resources demonstrate greater economic rates than OPEC countries. Japan's economic growth, driven by technological superiority, outpaces that of Saudi Arabia; South Korea is growing faster than oil-rich Nigeria; and Taiwan's economy has moved well beyond that of oil-rich Venezuela.

The United States and Norway are also rich in oil, yet their staggering economic growth comes from intellectual capital.

In reality, it is not money but intellectual capital that drives prosperity. More important, perhaps, is the reality that poverty is driven and sustained by a lack of intellectual capital. The intimate relationship between intellectual capital and economic growth is as old as humanity itself, and is well illustrated by this parable from ancient Babylon (modern-day Iraq).

A man asked his children:

"If you had a choice between the clay of wisdom or a bag of gold, which would you choose?"

"The bag of gold, the bag of gold" the naïve children cried, not realizing that wisdom had the potential to earn them many more bags of gold in the future.

Seven thousand years later,
Iraq — the cradle of civilization —

has its own private bag of gold as it sits perched atop the world's third largest oil reserves. Meanwhile, Israel, tucked away in the hostile terrain of a barren desert, has the clay of wisdom — the weightless wealth of intellectual capital embodied in the collective mind of its people.

The striking economic gap that persists between rich and poor nations has increased sevenfold over the past century to what is now an all-time high. The accumulation of intellectual capital by rich nations has helped broaden this gap because it has enabled them to control technology and collect hidden taxes from less affluent nations. For instance, Nigeria pays a 40-percent "royalty" tax on its petroleum revenues to foreign oil companies that are ripping out its family jewels — the huge store of wealth in its oilfields. These oilfields started forming when prehistoric, dog-sized humans — our common ancestor with the apes — walked African grasslands on four legs.

It's a shocking reality, but the deep oil reserves laid down by Mother Nature millions of years ago and nurtured through the millennia in Africa have been whittled away within decades. And, for the dubious privilege of surrendering its natural resources forever, Nigeria is required to pay half its petroleum revenue in the form of "royalties" to the rich kids on the global block, the United States and the Netherlands. That oilfield has been exchanged for a bowl of porridge, and the black gold that should serve the underserved in Nigeria is helping wealthy Westerners get wealthier.

Today, half the world's population — three billion people — live on an average of \$500 a year. In contrast, Bill Gates earns \$500 every second. By controlling technology and taxing computer users, Gates has become wealthier than each of the 70 poorest nations on earth and using his financial might has conquered more territory than Genghis Khan, Julius Caesar and Alexander the Great combined.

While Bill Gates is the new millennium's Prince of Technology, he is by no means the first to have taken on the huge potential offered by the realm of technology. The Romans used roads and military technology to expand their empire. And, for centuries, Britain ruled a quarter of the Earth due to its unparalleled ability to command maritime technology and conquer the Seven Seas.

Britain undoubtedly established itself as the world's first superpower through its rapid and ruthless colonial expansion program. The British raised the Union Jack over Canada and Australia, India and Hong Kong, Egypt and Kenya, and countless other countries — even the United States. The Union Jack cast its shadow in every global time zone, giving rise to the saying, "The sun never sets on the British Empire," a fact that was cold comfort to the colonized nations.

In the same way, the United States has embraced its technological supremacy.

both offensively and defensively, to build its own global empire without a physical presence in any of its "colonies." The sole remaining Superpower is at the forefront of every major technological advancement, which it has used to become deeply embedded in three-quarters of the globe. The US has accomplished a virtual economic colonization manifesting its presence throughout the globe by harnessing the power of technology and capitalizing on its clzy of wisdom.

Africa's inability to realize its potential and embrace technology has left it at the mercy of the West. The time has come for Africa to seize the day and resist the efforts of America and others to leave their imprint and plunder its natural resources.

Numerous examples throughout history support the idea that technology can be used as a tool of oppression. And there's little doubt that America's technological advancement has allowed it to exploit natural resources around the world. This is particularly evident

in Africa, where the US is exploiting oilfields beneath the pristine rainforest and being rewarded with a 40-percent tax at the expense of the African people. This lends credence to history's assertion that those who control technology oppress those who do not, eventually enslaving them and, finally, wielding power around the globe

Excerpted from a keynote speech delivered by Philip Emeagwali at the African Diaspora Conference in Tucson, Arizona on September 29, 2007. The entire transcript is posted at emeagwali.com.

Around the Globe, Technology Widens Rich-Poor Gap

by Philip Emeagwali

emeagwali.com

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In the same way, the United States has embraced its technological supremacy, both offensively and defensively, to build its own global empire without a physical presence in any of its "colonies." The sole remaining superpower is at the forefront of every major technological advancement, which it has used to become deeply embedded in three-quarters of the globe. The US has accomplished a virtual economic colonization manifesting its presence throughout the globe by harnessing the power of technology and capitalizing on its clay of wisdom.

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Numerous examples throughout history support the idea that technology can be used as a tool of oppression. And there's little doubt that America's technological advancement has allowed it to exploit natural resources around the world. This is particularly evident in Africa, where the US is exploiting oilfields beneath the pristine rainforest — and being rewarded with a 40-percent tax at the expense of the African people. This lends credence to history's

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assertion that those who control technology oppress those who do not, eventually enslaving them and, finally, wielding power around the globe.

Transcribed from a speech delivered by Philip Emeagwali at the African Diaspora Conference in Tucson, Arizona. The entire transcript is posted at emeagwali.com.

###

Within the Internet lies Africa's clay of wisdom

by Philip Emeagwali

emeagwali.com

According to history books, gun-wielding European slave traders kidnapped one in five Africans and transported them across the oceans to the Americas. A less visible, but no means less drastic technological tool of suppression, is the compass, a device used worldwide for navigation. In the same way that Britain used its maritime knowledge and the US harnessed its intellectual capital to rule the world, the early slave traders used the simple compass to wreak havoc on civilization.

It is a sad fact that the innocuous navigation tool originated during and was fuelled by the Atlantic slave trade. The technological development of the innocent compass, invented in China for religious divination 2,000 years ago, allowed Africa to be ravaged in unspeakable ways.

It was the compass that created the Atlantic slave trade, enabling the early colonial navigators — and their blood merchants — to chart an accurate course from Gorée Island, off the coast of Senegal, to Brazil; paving the way for the trans-Atlantic slave trade, which began on August 8, 1444. This trade in human merchandise covered four continents and lasted four centuries, and serves as a shameful beacon for the depravity of human greed and conquest.

The compass became the *de facto* weapon of mass destruction, which led to the de-capitalization and decapitation of Africa. It created the African Diaspora with one in five people taken out of the motherland. It was the largest and most brutal displacement of human beings in human history.

Today, it is hard to imagine that such destruction and the wholesale abduction of a race could result from a tool as common as the compass. Yet, as a people who survived the slave trade, we must draw our strength from lessons learned from the past and draw our energy from the power of the future. And the power of the future lies in “controlling” technology and harnessing it for the benefit of mankind, not for his destruction.

The people of Africa must take note that the Internet is our modern-day compass, and within it resides our own clay of wisdom. As we prepare for our great journey into the cyberspace of the future, with its technological promise — its clay of wisdom — we must understand the strategic value and potential of this all-important tool. Our image of the future inspires the present and the present serves to create the future.

Africa’s lack of substantial technological knowledge of the Internet and its potential may lead it to be assaulted or manipulated

in unexpected ways, just as it was devastated generations ago for the lack of a simple compass. We didn’t recognize the power of the compass then; the danger is that we don’t recognize the power of technology today. While Africa merely *contemplates* the future, the West, the quickest off the mark to wield technology’s weapons, actually *makes* the future.

This fact, and how the power of technology can be wielded against the poor, was brought home to me clearly when I received the following email recently:

“About a year ago, I hired a developer in Africa to do my job. I am paying him \$12,000 a year to do my job, for which I am paid \$67,000 a year,” the sender wrote. “He’s happy to have the work and I’m happy that I have to work only 90 minutes a day. Now I’m considering getting a second job and doing the same thing.”

Technology in the hands of others has been used to exploit Africa for centuries. But now it’s time for Africa to grasp technology and

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finally embrace the modern age's clay of wisdom and advancement. Africa has the chance to show the world how technology can be used for good, not evil. And the people of Africa can use today's technology, not to mimic their own exploitation, but to right the wrongs of the past and empower

themselves with the same tool that has been used to oppress them in the past. Africa can provide a shining example for the world in using technology for its own upliftment and the benefit of mankind.

This time, it is our choice.

Transcribed from a speech delivered by [Philip Emeagwali](#) at the African Diaspora Conference in Tucson, Arizona. The entire transcript is posted at [emeagwali.com](#).

###

Africa Must Produce or Perish

by Philip Emeagwali

emeagwali.com

Imagine that it is May 25, 2063, the 100th anniversary of Africa Day, a day for reflecting on Africa's successes and failures. The newspaper headline announces, "Last Remaining Oilfield in West Africa's American Territory Dries Up."

The article continues: "The last patch of rainforest will soon be empty land scarred by oil pipelines, pumping stations, and natural gas refineries. Wholesale pollution will be the environmental legacy for future generations.

"Africa's offshore oil reserves will ebb away. Abandoned oil wells could well become tourist attractions, and oil-boom settlements will be transformed into derelict ghost towns.

"In a world without oil, air travel will disappear, and people will voyage overseas on coal-powered ships. Farmers will use horses instead of tractors, and scythes instead of combine harvesters. As crops diminish and populations soar, famine will grip the globe. With no means to power their vehicles, parents will be housebound, without jobs, and children will walk to school."

This scenario could become a reality, because we no longer have an abundant oil supply. We know oil exists in limited quantities and that most oil wells dry up after 40 years. It is as certain as death and taxes. Rather than debate the exact year when we will run out of oil, I prefer to imagine that we have already run out. It may come sooner than any of us expect. Our heirs will thank or curse us for how

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much oil we left for them. Instead of asking, “When will Africa run out of natural resources?” we should ask, “When will Africa be unable to export raw materials, either for lack of our own oil or because foreign markets have themselves dried up?”

A \$100 bar of raw iron is worth \$200 when forged into drinking cups in Africa, \$65,000 when forged into needles in Asia, \$5 million when forged into watch springs in Europe. How can this be? European intellectual capital – the collective knowledge of its people – allows a \$100 raw iron bar to command a 50,000-fold increase! It could be said, therefore, that a lack of intellectual capital is the root cause of poverty.

Without African intellectual capital, iron excavated in Africa will continue to be manufactured in Europe and exported back to Africa at enormous cost. To alleviate poverty, Africa needs to cultivate creative and intellectual abilities that will allow it to increase the value of its raw materials and to break the continent’s vicious cycle of

poverty. Poverty is not an absence of money. Rather, it results from an absence of knowledge.

In oil-exporting African nations, multinationals such as Shell (selling rigs for a 40% royalty on exported oil) are getting rich, while the oil rig workers remain poor. Instead of addressing the underlying causes of poverty – minimal productivity resulting from a lack of intellectual capital – Third World leaders have focused on giving false hope to their people.

We need less talk about poverty and more action to eliminate it. So how do we do this? Education has done more to reduce poverty than all the oil companies in the world. So it is disheartening to realize that few leaders believe that their people’s potential is far more valuable than what lies beneath the soil.

Intellectual capital, not higher wages, will eliminate poverty in Africa. If we all demand higher wages, we will end up paying the higher wages to ourselves.

Intellectual capital will result in the creation of new products derived

from new technologies. The end result will be not just a redistribution of wealth, but the creation and control of new wealth.

And Africa's power to reduce poverty will open the floodgates of prosperity for millions of people. One catalyst for such prosperity could be telecommuting. If 300 million Africans could work for companies located in the West (just as millions of Indians do), then both regions would benefit. The strategy would be to recognize the labor needs of the global marketplace, and enable Africa to fulfill those needs.

For example, tax preparation experts living in Africa, where labor is cheaper, could fulfill the needs of US-based accountants. Furthermore, the time difference could allow for a fast turnaround in service. It is clear that knowledge and technology is crucial to alleviate Africa's poverty.

Africa will perish if it continues to consume what it does not produce, and produce what it does not consume. The result will

be a depressing cycle of increasing consumption, decreasing production, and increasing poverty. We are missing a golden opportunity by not using the trillion dollars earned by exporting natural resources to break Africa's cycle of poverty.

We are at a crossroads where one signpost reads "Produce" and another reads "Perish." We risk becoming like the driver who stops at an intersection and asks a pedestrian, "Where does this road lead?"

And the pedestrian replies, "Where do you want to go?"
"I don't know," the driver replies.

"Then it obviously doesn't matter which road you take!" replies the pedestrian.

If we adopt the same attitude as the driver, Africa will have lost its chance to "choose" its future.

For decades, power in post-colonial Africa rested in the hands of those with guns, not those with brains. We were not always at war with our neighbors, but we were

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always at war with poverty. And we spent more on guns than on books and bread.

Africa's choice is clear: produce or perish. However, it is important that we do not blindly choose the lesser of two evils – producing what we cannot consume or consuming what we cannot produce. We can avoid this. My wish is that by the end of the 21st century high-end products in New York City will sport the label: “Made in Africa.”

We cannot look forward to our future until we learn from our past. Five thousand years of recorded history reveal that technology was ancient Africa's gift to the modern world. Forty and a half centuries ago, geometers in Africa's Nile

Valley region designed the Great Pyramid of Giza, the last of the Seven Wonders of the Ancient World. That man-made mountain remains the largest stone building on Earth. It is an icon of engineering, and testifies that Africa was once the world's most technologically advanced region.

It is absolutely imperative that Africa regain its technological prominence, which will enable it to produce what the world can consume. When we do that, Africa will finally be eating the fruits of its own labor. When Africa has regained its technological prominence, the world's leaders will seek it out. And, like a rainforest renewed, Africa will flourish again.

Transcribed from a speech delivered by [Philip Emeagwali](#) to the African community in Valencia, Spain. The entire transcript and [video](#) are posted at [emeagwali.com](#).

#

Ideas, Not Money, Alleviate Poverty

by Philip Emeagwali

emeagwali.com

I once believed that *capital* was another word for money, the accumulated wealth of a country or its people. Surely, I thought, wealth is determined by the money or property in one's possession. Then I saw a Deutsche Bank advertisement in the *Wall Street Journal* that proclaimed: "Ideas are capital. The rest is just money."

I was struck by the simplicity of such an eloquent and forceful idea. I started imagining what such power meant for Africa. [The potential for progress and poverty alleviation in Africa relies on capital generated from the power within our minds, not from our ability to pick minerals from the ground or seek debt relief and foreign assistance.](#)

If ideas are capital, why is Africa investing more on things than on information, and more on the military than on education? Suddenly, I realized what this idea could mean for Africa. If the pen is mightier than the sword, why does a general earn more than the work of a hundred writers combined? If ideas are indeed capital, then Africa should stem its brain drain and promote the African Renaissance, which will lead to the rebirth of the continent. After all, a renaissance is a rebirth of ideas. And knowledge and ideas are the engines that drive economic growth.

When African men and women of ideas, who will give birth to new ideas, have fled to Europe and the United States, then the so-called African Renaissance cannot occur

in Africa. It can only occur in Paris, London and New York. There are more Soukous musicians in Paris, than in Kinshasha; more African professional soccer players in Europe, than in Africa. African literature is more at home abroad than it is in Africa. In other words, Africans in Europe are alleviating poverty in Europe, not in Africa. Until the men and women of ideas — the true healers of Africa — start returning home, the African Renaissance and poverty alleviation will remain empty slogans. After all, the brightest ideas are generated and harnessed by men of ideas.

The first annual report by J.P. Morgan Chase, a firm with assets of 1.3 trillion dollars, reads: “The power of intellectual capital is the ability to breed ideas that ignite value.” This quote is a clarion call to African leaders to shift purposefully and deliberately from a focus on things to a focus on information; from exporting natural resources to exporting knowledge and ideas; and from being a consumer of technology to becoming a producer of technology.

For Africa, poverty will be reduced when intellectual capital is increased and leveraged to export knowledge and ideas. Africa’s primary strategy for poverty alleviation is to gain debt relief, foreign assistance, and investments from western nations. Poverty alleviation means looking beyond 100 percent literacy and aiming for 100 percent numeracy, the prerequisite for increasing our technological intellectual capital. Yet, *in this age of information and globalization when poverty alleviation should result in producing valuable products for the global market and competing with Asia, the United States, and Europe — shamefully, diamonds found in Africa are polished in Europe and re-sold to Africans.*

The intellectual capital needed to produce products and services will lead to the path of poverty alleviation. Intellectual capital, defined as the collective knowledge of the people, increases productivity. The latter — by driving economic growth — alleviates poverty, always and everywhere, even in Africa.

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Productivity is the engine that drives global economic growth.

Those who create new knowledge are producing wealth, while those who consume it are producing poverty. If you attend a Wole Soyinka's production of Chinua Achebe's "Things Fall Apart," you consume the knowledge produced by Soyinka and Achebe as well as the actor's production, much like I consume the knowledge and production of Bob Marley's through his songs.

We will need wisdom, that which turns too much information — or information overload — into focused power, not only to process, but also to evaluate the overwhelming amount of information available on the Internet. This wisdom will give us the competitive edge and enable us to find creative solutions.

The following story illustrates the difference between information and wisdom. Twelve hundred years ago, in the city of Baghdad, lived a genius named Al-Khwarizmi, who was one of the fathers of algebra. In fact, the word

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algebra comes from the title of his book *Al-jabr*, which for centuries was the standard mathematics textbook. Al-Khwarizmi taught in an institution of learning called the *House of Wisdom*, which was the center of new ideas during Islam's golden age of science. To this day we computer scientists honor Al-Khwarizmi when we use the word *algorithm*, which is our attempt to pronounce his name.

One day, Al-Khwarizmi was riding a camel laden down with algebraic manuscripts to the holy city of Mecca. He saw three young men crying at an oasis. "My children, why are you crying?" he enquired.

"Our father, upon his death, instructed us to divide his 17 camels as follows: 'To my oldest son I leave half of my camels, my second son shall have one-third of my camels, and my youngest son is to have one-ninth of my camels.'"

"What, then, is your problem?" Al-Khwarizmi asked.

“We have been to school and learned that 17 is a prime number that is, divisible only by one and itself and cannot be divided by two or three or nine. Since we love our camels, we cannot divide them exactly,” they answered.

Al-Khwarizmi thought for a while and asked, “Will it help if I offer my camel and make the total 18?”

“No, no, no,” they cried. “You are on your way to Mecca, and you need your camel.”

“Go ahead, have my camel, and divide the 18 camels amongst yourselves,” he said, smiling.

So the eldest took one-half of 18 — or nine camels. The second took one-third of 18 — or six camels. The youngest took one-ninth of 18 — or two camels. After the division, one camel was left: Al-Khwarizmi’s camel, as the total number of camels divided among the sons (nine plus six plus two) equaled 17.

Then Al-Khwarizmi asked, “Now, can I have my camel back?”

These young men had information about prime numbers, but they lacked the wisdom to use the information effectively. It is the manipulation of information to accomplish seemingly impossible purposes that defines true wisdom.

Today, we have ten billion pages of information posted on the Internet — more than enough to keep us busy the rest of our lives, and new information is being added daily. More information has been created in the last 100 years than in all of the previous 100,000 years combined. We need the wisdom to sift through and convert these billions of pages into information riches.

The genius of Al-Khwarizmi was not in his mathematical wizardry or even his book knowledge: It was in his experiential knowledge — his big-picture, right-brain thinking; creativity; innovation; and wisdom. It was his wisdom to add a camel to make the total 18 and still get his camel back.

Prime numbers are to whole numbers what the laws of physics

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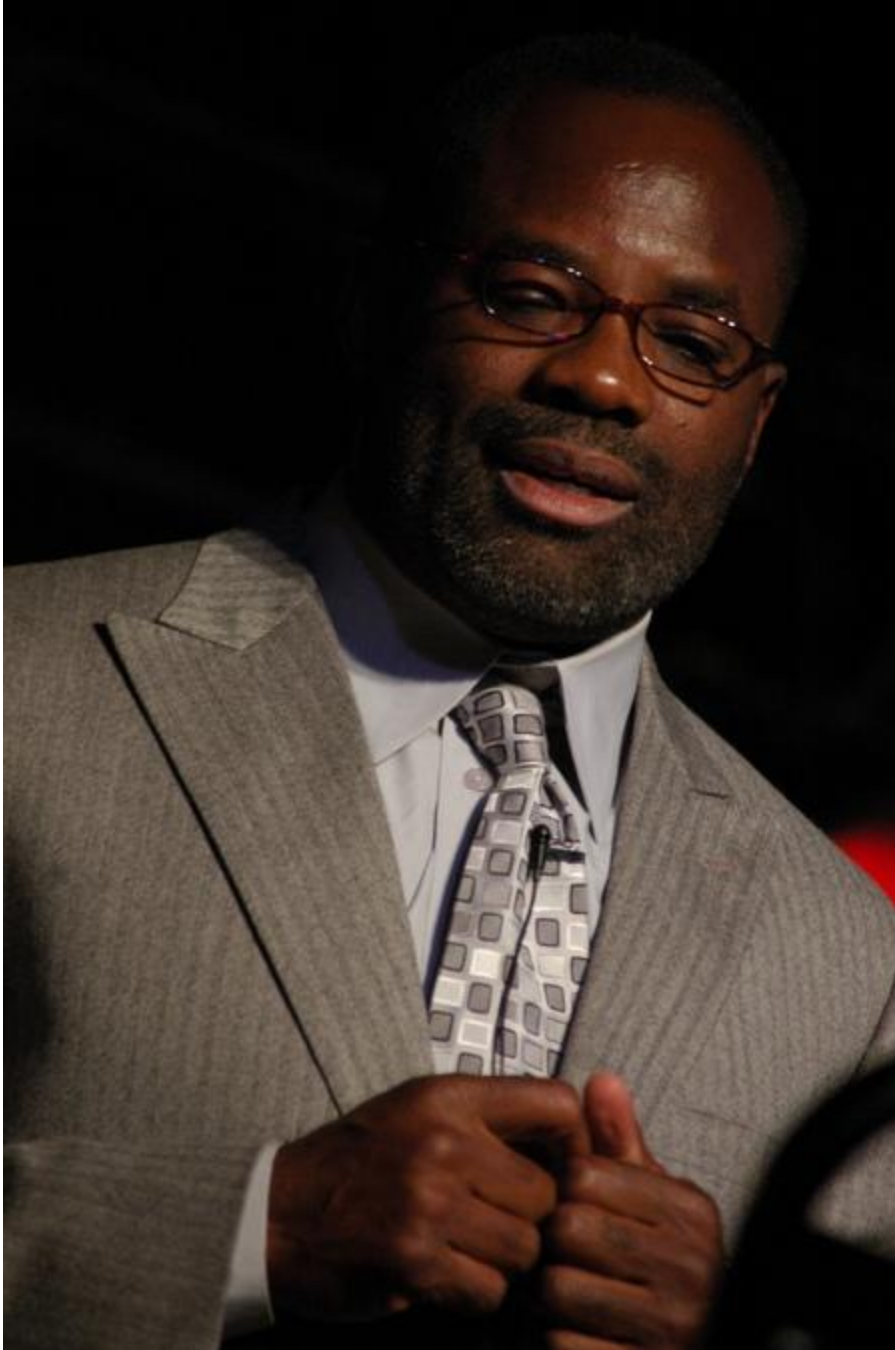
are to physics. Twenty years ago, I used an Al-Khwarizmi approach to solve a notoriously difficult problem in physics. I added inertial force, which enabled me to reformulate Newton's Second Law of Motion first as 18 equations and algorithms, and then as 24 million algebraic equations. Finally, I programmed 65,000 "electronic brains" called processors to work as one to solve those 24 million equations at a speed of 3.1 billion calculations per second.

Like Al-Khwarizmi, I derived my 18 equations through out-of-the-box thinking in an in-the-box world, adding my metaphorical camel: inertial force. In other words, I applied wisdom to known knowledge to generate intellectual capital.

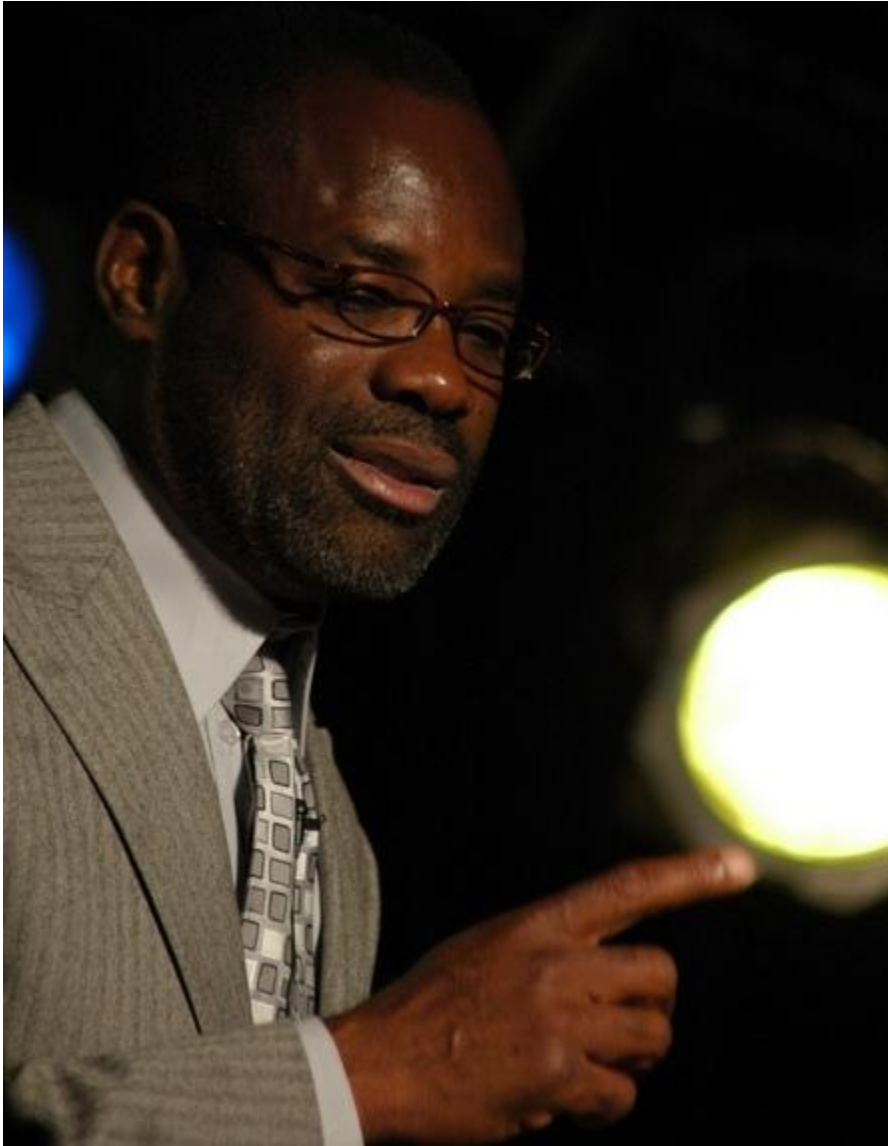
Unless Africa significantly increases its intellectual capital, the continent will remain irrelevant in the 21st century and even beyond. Africa needs innovators, producers of knowledge, and wise men and women who can discover, propose, and then implement progressive ideas. Africa's fate lies in the hands of Africans and the solution to poverty must come from its people. The future that lies ahead of Africa is for Africa to create, after the people have outlined their vision. We owe it to our children to build a firm foundation to enable them go places we only dreamt. For Africa to take center stage in today's economic world, we have to go out and compete on a global basis. There is simply no other way to succeed.

Transcribed from a [lecture](#) delivered by [Philip Emeagwali](#) at the University of Alberta, Canada.

Location & date for photos in a grey suit: Philip Emeagwali speaking at the Students Union Building of the University of Alberta, Canada - www.ualberta.ca - on September 23, 2006 at about 8:00 p.m



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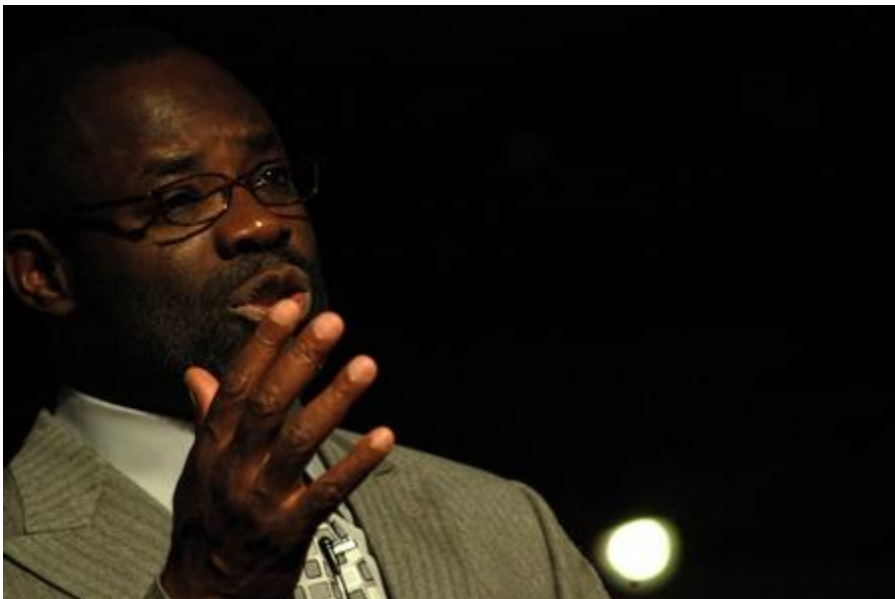


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###

How Do We Reverse the Brain Drain?

Part 1

by Philip Emeagwali

emeagwali.com



Philip Emeagwali, keynote speaker, Pan-African Conference on Brain Drain, Principia College, Elsah, Illinois, October 24, 2003.

For 10 million African-born emigrants, the word "home" is

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synonymous with the United States, Britain or other country outside of Africa.

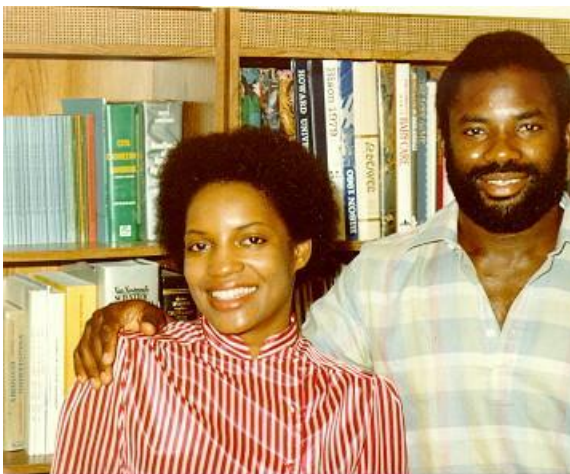
Personally, I have lived continuously in the United States for the past 30 years. My last visit to Africa was 17 years ago.

On the day I left Nigeria, I felt sad because I was leaving my family behind. I believed I would return eight years later, probably marry an Igbo girl, and then spend the rest of my life in Nigeria.

But 25 years ago, I fell in love with an American girl, married her three years later, and became eligible to sponsor a Green Card visa for my 35 closest relatives, including my parents and all my siblings, nieces and nephews.

The story of how I brought 35 people to the United States exemplifies how 10 million skilled people have emigrated out of Africa during the past 30 years. We came to the United States on student visas and then changed our status to become permanent residents and then naturalized citizens. Our new citizenship status helped us sponsor relatives, and also inspired our friends to immigrate here.

Ten million Africans now constitute an invisible nation that resides outside Africa. Although invisible, it is a nation as populous as Angola, Malawi, Zambia or Zimbabwe. *If it were to be a nation with distinct borders, it would have an income roughly equivalent to Africa's gross domestic product.*



Although the *African Union* does not recognize the African Diaspora as a nation, the *International Monetary Fund* (IMF) acknowledges its economic importance. The IMF estimates the African Diaspora now constitutes the biggest group of foreign investors in Africa.



Take for example *Western Union*. It estimates that it is not atypical for an immigrant to wire \$300 per month to relatives in Africa. If you assume that most Africans living outside Africa send money each month and you do the math, you will agree with the IMF that the African Diaspora is indeed the largest foreign investor in Africa.

What few realize is that Africans who immigrate to the United States contribute 40 times more wealth to the American than to the African economy. According to the United Nations, an African professional working in the United States contributes about \$150,000 per year to the U.S. economy.

Again, if you do the math, you will realize that the African professional remitting \$300 per

Nigeria achieved political independence in 1960, but by the year 2000 had not yet achieved technological independence.

month to Africa is contributing 40 times more to the United States economy than to the African one. On a relative scale, that means for every \$300 per month a professional African sends home, that person contributes \$12,000 per month to the U.S. economy.

Of course, the issue more important than facts and figures is eliminating poverty in Africa, not merely reducing it by sending money to relatives. Money alone cannot eliminate poverty in Africa, because even one million dollars is a number with no intrinsic value. Real wealth cannot be measured by money, yet we often confuse money with wealth. Under the status quo, Africa would still remain poor even if we were to send all the money in the world there.

Ask someone who is ill what "wealth" means, and you will get a

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very different answer than from most other people. If you were HIV-positive, you would gladly exchange one million dollars to become HIV-negative.

When you give your money to your doctor, that physician helps you convert your money into health - or rather, wealth.

Money cannot teach your children. Teachers can. Money cannot bring electricity to your home. Engineers can. Money cannot cure sick

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people. Doctors can. Because it is only a nation's human capital that can be converted into real wealth, that human capital is much more valuable than its financial capital.

A few years ago, Zambia had 1,600 medical doctors. Today, Zambia has only 400 medical doctors. Kenya retains only 10% of the nurses and doctors trained there. A similar story is told from South Africa to Ghana.

How Do We Reverse the Brain Drain? Part 2

by Philip Emeagwali

emeagwali.com



I also speak from my family experiences. After contributing 25 years to Nigerian society as a nurse,

my father retired on a \$25-per-month pension. By comparison, my four sisters each earn

\$25 per *hour* as
nurses in the United
States. If my father
had had the
opportunity my

sisters did, he
certainly would have
immigrated to the
United States as a
young nurse.

Because of that lack of knowledge, Africa exports raw steel, only to import cars that are essentially steel products.



Nursing Staff at General Hospital, Agbor, Nigeria. James Emeagwali (second from right of front row). Notice my father is the only one holding a book (most likely *Rosicrucian Digest*, *Reader's Digest* or *West African Pilot* newspaper.) I developed my reading habit from him. (Circa 1964)

The "brain drain" explains, in part, why affluent Africans fly to London for their medical treatments. Furthermore, because a significant percentage of African doctors and nurses practice in U.S. hospitals, we can reasonably conclude that African medical schools are *de facto* serving the American people, not Africa.

A recent World Bank survey shows that African universities are exporting a large percentage of their graduating manpower to the United States. In a given year, the World Bank estimates that 70,000 skilled Africans immigrate to Europe and the United States. While these 70,000 skilled Africans

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are fleeing the continent in search of employment and decent wages, 100,000 skilled expatriates who are paid wages higher than the prevailing rate in Europe are hired to replace them.

In Nigeria, the petroleum industry hires about 1,000 skilled expatriates, even though we can find similar skills within the African Diaspora. Instead of developing its own manpower resources, Nigeria prefers to contract out its oil exploration despite the staggeringly high price of having to concede 40% of its profits to foreign oil companies.

In a pre-Independence Day editorial, the *Vanguard* (Nigeria) queried: "Why would the optimism of 1960 give way to the despair of 2000?"

My answer is this: Nigeria achieved political independence in 1960, but by the year 2000 had not yet achieved technological



Lisa S. Chiteji, myself and Sombo Nkwhazi holds a conversation on brain drain from Africa at Principia College, Elsah, Illinois. October 24, 2003.

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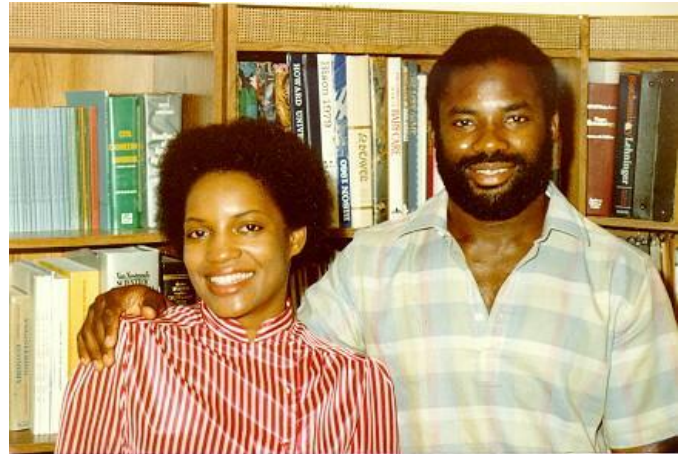
During colonial rule, Nigeria retained only 50% of the profits from oil derived from its own territory. Four decades after this colonial rule ended, the *New York Times* (December 22, 2002) wrote that "40 percent of the oil revenue goes to Chevron, [and] 60 percent to the [Nigerian] government."

As a point of comparison, the United States would never permit

Africa cannot eliminate poverty without first increasing and nurturing its intellectual capital.

a Nigerian oil company to retain 40% of the profits from a Texas oilfield.

Our African homelands have paid an extraordinary price for their lack of domestic technological knowledge.



A photo of my wife Dale and I, both products of the brain drain from Africa.

Because of that lack of knowledge, since it gained independence in 1960, Nigeria has relinquished 40% of its oilfields and \$200 billion to American and European stockholders.

Because of that lack of knowledge, Nigeria exports crude petroleum, only to import refined petroleum. Because of that lack of knowledge, Africa exports raw steel, only to import cars that are essentially steel products.

Knowledge is the engine that drives economic growth, and Africa cannot eliminate poverty without first increasing and nurturing its intellectual capital. Reversing the "brain drain" will increase Africa's intellectual capital while also increasing its

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wealth in many, many different
ways.

How Do We Reverse the Brain Drain? Part 3

by Philip Emeagwali

emeagwali.com



Can the "brain drain" be reversed? My answer is: yes. But in order for it to happen, we must try something different. At this point,

If Africa succeeds in capturing one million of these high-tech jobs, they could provide more revenues than all the African oilfields.

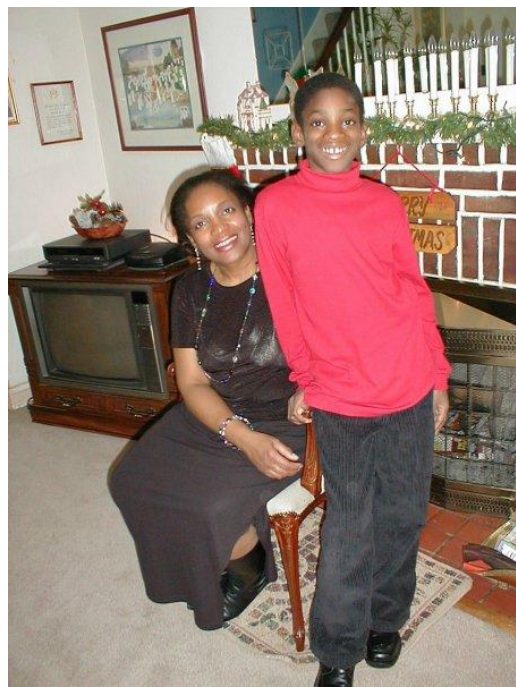
I want to inject a new idea into this dialogue. For my idea to work, it requires that we tap the talents and skills of the African Diaspora. It requires that we create one million high-tech jobs in Africa. It requires that we move one million high-tech jobs from the United States to Africa.

I know you are wondering: How can we move one million jobs from the United States to Africa? It can be done. In fact, by the year

2015 the U.S. Department of Labor expects to lose an estimated 3.3 million call center jobs to developing nations.

A photo of two talented scientists of the 200 million African Diaspora, my wife Dale and son Ijeoma. In my speeches on reversing the brain drain, I proposed the now created 6th Region of African Union to represent 200 million Diasporans, such as Dale and Ijeoma and his maternal grand parents. [Photo taken by my mother-in-law at her Baltimore home on Christmas Day of 2000]

In this area, what we as Africans need to do is develop a strategic plan - one that will persuade



multinational companies that it will be more profitable to move their call centers to nations in Africa instead of India.

These high-tech jobs include those in call centers, customer service and help desks - all of which are suitable for unemployed university graduates.

The reason these jobs could now emerge in Africa is that recent technological advances such as the Internet and mobile telephones now make it practical, cheaper and otherwise advantageous to move these services to developing nations, where lower wages prevail.

If Africa succeeds in capturing one million of these high-tech jobs, they could provide more revenues than all the African oilfields. These "greener pastures" would lure back talent and, in turn, create a reverse "brain drain."

Again, we have a rare and unique window of opportunity to convert

projected American job losses into Africa's job gain, and thus change the "brain drain" to "brain gain."

However, aggressive action must be taken before this window of opportunity closes. India is a formidable competitor. Therefore, we need to determine the cost savings realized by outsourcing call center jobs to Africa instead of India. That cost saving will be used as a selling point to corporations interested in outsourcing jobs.

A typical call center employee might be a housewife using a laptop computer and a cell phone to work from her home. As night settles and her children go to bed, she could place a phone call to



I redefined my Mississippi-born mother-in-law, Mrs. Doris Brown as belonging to the 6th

Region of Africa that I proposed in this lecture. [Photo taken by her husband Leon Brown in Baltimore, Maryland]

Los Angeles, which is 10 hours behind her time zone. An American answers her call and she says, "Good morning, this is Zakiya." Using a standard, rehearsed script, she tries to sell an American product.

Now that USA-to-Africa telephone calls are as low as 6 cents per minute, it is economically feasible for a telephone sales person to reside in Anglophone Africa while

virtually employed in the United States, and—this is important—paying income taxes only to her country in Africa.

I will give one more example of how thousands of call center jobs can be created in Africa. It is well known that U.S. companies often give up on collecting outstanding account balances of less than \$50 each. The reason is that it often costs \$60 in American labor to recover that \$50.

By comparison, I believe it would cost only \$10 in African labor (including the 6 cents per minute phone call) to collect an outstanding balance of \$50.

How Do We Reverse the Brain Drain? Part 4

by Philip Emeagwali

emeagwali.com



Bente Morse and Philip Emeagwali at the Pan-African Conference on Brain Drain (Principia Guest House, Principia College, Elsah, Illinois, October 26, 2003)

Earlier, the organizers of this Pan-African Conference gave me a note containing eleven questions. The first was:

Do skilled Africans have the moral obligation to remain and work in Africa?

I believe those with skills should be encouraged and rewarded to stay, work, and raise their families in Africa. When that happens, a large middle class will be created, thereby reducing the conditions that give rise to civil war and corruption. Then, a true revitalization and renaissance will occur.

The second question was:

Should skilled African emigrants be compelled to return to Africa?

I believe controlling emigration will be very difficult. Instead, I recommend the United Nations impose a "brain gain tax" upon those nations benefiting from the "brain drain." Each year, the United States creates a brain drain by issuing 135,000 H1-B visas to "outstanding researchers" and persons with "extraordinary ability." The U.S. Internal Revenue Service (IRS), working in tangent with the Immigration and Naturalization Service (INS), could be required to credit one month's salary, each year, to the country of birth of each immigrant. Already, the IRS allows U.S. taxpayers to

make voluntary contributions to election funds. Similarly, it could allow immigrants to voluntarily pay taxes to their country of birth, instead of to the United States.

The third question was:

Why don't we encourage unemployed Africans to seek employment abroad?

Put differently, if all the nurses and doctors in Africa were to win the U.S. visa lottery, who will operate our hospitals? If we encourage 8 million talented Africans to emigrate, what will we encourage their remaining 800 million brothers and sisters to do?

The fourth question was:

Should we blame the African Diaspora for Africa's problems?

Yes, the Diaspora should be blamed in part, because the absence it's created has diminished the continent's intellectual capital and thus created the vacuum enabling dictators and corruption to flourish. The likes of Idi Amin, Jean-Bedel

Bokassa and Mobutu Sese Seko would not be able to declare themselves president-for-life of nations who have a large, educated middle class.

The fifth question was:

Should we not blame Africa's leaders for siphoning money from Africa's treasuries?

It becomes a vicious circle: the flight of intellectual capital increases the flight of financial capital which in turn increases again the flight of intellectual capital. Leadership is a collective process, and "brain drain" reduces the collective brainpower needed to fight corruption and mismanagement.

For example, the leadership of the Central Bank of Nigeria did not call a news conference after Sani Abacha stole \$3 billion dollars from it. The bank's Governor-General did not go on a hunger strike. He did not report the robbery to the police. He did not file a lawsuit. Had they the intellectual manpower to counter corruption, the results would have been very different.

The sixth question was:

Is it possible to achieve an African renaissance?

Because by definition, a renaissance is the revival and flowering of the arts, literature and sciences, it must be preceded by a growth in the continent's

intellectual capital, or the collective knowledge of the people. The best African musicians live in France. The top African writers live in the United States or Britain. The soccer superstars live in Europe. It will be impossible to achieve a renaissance without the contributions of the talented.

How Do We Reverse the Brain Drain?

Part 5: Is Brain Drain Modern Slavery?

by Philip Emeagwali

emeagwali.com



Lisa S. Chiteji, Philip Emeagwali and Sombo Nkwhazi-principia at the Pan-African Conference on Brain Drain (Principia College, Elsah, Illinois, October 24, 2003)

The seventh question was:

For how long has the "brain drain" problem existed?

A common misconception is that the African "brain drain" started 40 years ago. In reality, it actually began ten times that long. Four hundred years ago, most people of African descent lived in Africa. Today, one in five of African descent live in the Americas. Therefore, measured in numbers, the largest "brain drain" resulted from the trans-Atlantic slave trade.

Contrary to what people believed, Africa experienced a brain gain during the first half of the 20th century. Schools, hospitals and banks were built by the British colonialists. These institutions were the visible manifestations of brain gain. At the end of colonial rule, skilled Europeans fled the continent. Skilled Africans started fleeing the continent in the 1970s, 80s, and 90s. The result was the widespread rise of despotic rulers.

The eighth question was:

Is "brain drain" a form of modern slavery?

By the end of the 21st century, people will have different sensibilities and will describe it as modern day slavery. In the 19th century, which was an Agricultural Age, the U.S. economy needed strong hands to pick cotton, and the young and sturdy were forced into slavery. In the 21st century, which is an Information Age, the U.S. economy needs persons with "extraordinary ability" and the best and brightest are lured with Green Card visas. Africans who are illiterate or HIV-positive are automatically denied American visas.

The ninth question was:

Do you believe that the "brain drain" can be reversed?

As I stated earlier, "brain drain" is a complex and multidimensional problem that can be reversed into "brain gain."

India is now reversing its "brain drain," and turning it into "brain gain;" I believe Africa can do the same. But unless we reverse it, the

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dream of an African renaissance will remain an elusive one.

The tenth question was:

Can we blame globalization as a cause of brain drain?

Globalization began 400 years ago with the trans-Atlantic slave trade that brought the ancestors of 200 million Africans now living in the Americas. It has accelerated because the Internet and cell phone now enable you to communicate instantaneously with any person on the globe.

Overall, globalization is a force that is denationalizing the wealth of developing nations. Economists have confirmed that the rich nations are getting richer while the poor ones are getting poorer. We also know that the globalization process is increasing the foreign debts of developing nations, accelerating the flight of financial and intellectual capital to western nations.

The economics of offshoring will force multinational corporations to

outsource to developing nations where lower wages prevail.

To remain competitive and profitable, companies will be forced to reduce costs by hiring five-dollars-an-hour computer programmers living in Third World countries and lay off expensive American programmers that demand \$50 an hour. In the long term, offshoring will reverse the flight of financial and intellectual capital from western nations to the Third World.

The eleventh question was:

Why have I lived in the United States for 30 continuous years?

Africa has bitten at my soul since I left. My roots are still in Africa. My house is filled with Africana - food, paintings, music, and clothes - to remind me of Africa. I long to visit the motherland, but I must confess that when Africa called me to return home, I couldn't answer that call. The reason is that I work on creating new knowledge that could be used to redesign supercomputers. The most powerful supercomputers cost \$120 million each and Nigeria

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could not afford to buy one for me. I created the knowledge that the power of thousands of processors can be harnessed; this knowledge, in turn, inspired the reinvention of vector supercomputers into massively parallel supercomputers. New knowledge must precede new technological products and the supercomputer of today will become the personal computer of tomorrow. And so to answer your question: even though I reside in the U.S. the knowledge that I created is now materializing into better personal computers purchased by Africans.

Finally, millions of high-tech jobs can be performed from Africa, but may instead be lost to India. We must identify the millions of jobs that will be more profitable when transferred from the United States to Africa.

Doing so will enable us to create a brain drain from the United States and convert it to a brain gain for Africa.

Transcribed from speech delivered by [Philip Emeagwali](#) at the Pan African Conference on Brain Drain, Elsah, Illinois

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How Do We Reverse the Brain Drain?

by Philip Emeagwali

emeagwali.com

Keynote speech by [Emeagwali](#) at the Pan African Conference on Brain Drain, Elsau, Illinois on October 24, 2003. [French](#) translation provided by Abdoulaye CAMARA of [AfricaMaat](#).

Merci pour cette plaisante introduction et pour m'avoir invité à partager mes idées sur la transformation de la "fuite des cerveaux" en "profit des cerveaux."

Pour 10 millions d'émigrés africains nés hors du continent, le terme "maison" correspond aux Etats-Unis, à la Grande-Bretagne ou à tout autre pays hors d'Afrique.

Personnellement, je vis aux Etats-Unis depuis les 30 dernières années. Ma dernière visite en Afrique remonte à 17 ans maintenant.

Le jour où j'ai quitté le Nigeria, j'ai ressenti une grande tristesse parce que je laissais ma famille

derrière moi. J'ai cru que je reviendrais huit ans plus tard, que j'épouserai une Igbo, et que je passerai alors le reste de ma vie au Nigeria.

Mais il y a 25 ans, je suis tombé amoureux d'une américaine, nous sommes mariés trois ans plus tard, et j'ai pu obtenir une carte verte pour 35 des membres de ma famille la plus proche, y compris mes parents et tous mes cousins, nièces et neveux.

C'est de la même manière que 10 millions de personnes qualifiées ont émigré hors d'Afrique pendant ces 30 dernières années. Nous sommes venus aux Etats-Unis grâce à des visas d'étudiant, pour

ensuite devenir des résidents permanents et enfin des citoyens naturalisés. Notre nouvelle citoyenneté nous a permis d'aider nos parents à nous rejoindre, et a également encouragé nos amis à immigrer ici.

Dix millions d'Africains constituent maintenant une nation invisible résidant hors d'Afrique. Bien qu'invisible, il s'agit d'une nation aussi peuplée que l'Angola, le Malawi, la Zambie ou le Zimbabwe. Si cette nation avait des frontières distinctes, elle aurait un produit brut équivalent au produit intérieur brut du continent africain tout entier.

Bien que l'Union Africaine ne considère pas la Diaspora africaine comme une nation, le Fonds monétaire international (FMI) reconnaît son importance économique. Le FMI estime que la Diaspora africaine constitue maintenant le plus grand groupe d'investisseurs étrangers en Afrique.

Prenons Western Union par exemple. Ils estiment qu'il n'est pas rare qu'un immigré envoie 300€ par mois à sa famille restée en Afrique. Si vous supposez que la plupart des africains vivant hors d'Afrique envoient de l'argent chaque mois et que vous faites le calcul, vous admettez comme le FMI que la Diaspora africaine est effectivement le plus grand investisseur étranger en Afrique.

Ce que peu réalisent c'est que les Africains qui immigreront aux Etats-Unis contribuent 40 fois plus à la richesse américaine qu'à l'économie africaine. Selon les Nations Unies, un professionnel africain travaillant aux Etats-Unis contribue pour environ 150 000\$ par an à l'économie des Etats-Unis.

De plus, si vous faites le calcul, vous vous rendrez compte que le professionnel africain qui envoie 300€ par mois en Afrique contribue 40 fois plus à l'économie des Etats-Unis qu'à l'économie africaine.



L'argent seul ne peut pas éliminer la question de la pauvreté en Afrique, parce que même un million de dollars ne veut rien dire

Emeagwali at the Pan African Conference

Delivering the keynote speech
[Principia College (prin.edu), Elsah, Illinois, October 24, 2003]

Cela signifie qu'à chaque fois qu'un professionnel africain envoie 300€ en Afrique, ce dernier contribue pour 12 000€ à l'économie des Etats-Unis. Naturellement, une question plus importante que l'énumération de faits et de chiffres est l'élimination de la pauvreté en Afrique, pas simplement en la réduisant par des envois d'argent au pays.

intrinsèquement.

La véritable richesse ne peut pas être mesurée en argent, pourtant nous confondons souvent argent et richesse. Dans la situation actuelle, l'Afrique resterait pauvre même si nous devions y envoyer tout l'argent du monde.

Demandez à quelqu'un qui est malade ce que la "richesse" signifie, et vous aurez une réponse très différente de la plupart des personnes.

Si vous aviez le SIDA, vous donneriez volontiers un million de dollars pour ne plus l'être.

Quand vous donnez votre argent à votre docteur, ce médecin vous aide à changer votre argent en santé - ou plutôt, richesse. L'argent ne peut pas enseigner à vos enfants. Les enseignants le peuvent. L'argent ne peut pas vous apporter l'électricité. Les ingénieurs le peuvent. L'argent ne peut pas guérir les personnes malades. Les médecins le peuvent.

C'est parce que seul le capital humain d'une nation constitue une véritable richesse, que le capital humain vaut beaucoup plus que le capital financier.

Il y a quelques années, la Zambie avait 1 600 médecins. Aujourd'hui, la Zambie n'a seulement que 400 médecins. Le Kenya retient seulement 10% de ses infirmières et de ses médecins qualifiés. On raconte une histoire semblable d'Afrique du Sud jusqu'au Ghana. Je parle également de mes expériences de famille. Après avoir travaillé pendant 25 ans au Nigeria en tant qu'infirmier, mon père s'est retiré avec une pension de 25€ par mois.

En comparaison, mes quatre sœurs gagnent chacune 25€ de l'heure en tant qu'infirmières aux Etats-Unis. Si mon père avait eu la même opportunité que mes sœurs, il aurait certainement immigré aux Etats-Unis en tant que jeune infirmier. La "fuite des cerveaux" explique, en partie, pourquoi les Africains fortunés vont à Londres pour se faire soigner. D'autre part, à cause du pourcentage important de médecins et d'infirmières africains pratiquant dans des hôpitaux aux ETATS-UNIS, nous pouvons raisonnablement conclure que les écoles de médecines africaines profitent à la population américaine, non à l'Afrique.

Une récente enquête de la Banque Mondiale indique que les universités africaines exportent un pourcentage important de leurs diplômés vers les Etats-Unis. Dans une année donnée, la Banque Mondiale estime que 70 000 africains qualifiés immigreront vers l'Europe et les Etats-Unis.

Tandis que ces 70 000 africains qualifiés se sauvent du continent à la recherche d'emplois et de

salaires décents, 100 000 expatriés qualifiés, au salaire plus élevé qu'il ne le serait en Europe, sont embauchés pour les remplacer.

Au Nigeria, l'industrie pétrolière recrute environ 1 000 expatriés qualifiés, alors même que nous pourrions trouver les mêmes qualifications dans la Diaspora africaine. Au lieu d'utiliser sa propre main d'œuvre, le Nigeria préfère sous-traiter son exploitation pétrolière en dépit d'un prix stupéfiant qui passe par la concession de 40% de ses bénéfices aux compagnies pétrolières étrangères.

Dans l'édition d'un journal de la pré-indépendance, L'Avant-garde (Nigeria) posa la question suivante : "pourquoi l'optimisme de 1960 mènerait au désespoir en 2000 ?"

Ma réponse est celle-ci : Le Nigeria a réalisé l'indépendance politique en 1960, mais elle n'a pas encore réalisé l'indépendance technologique en 2000.

Durant la période coloniale, le Nigeria ne bénéficiait seulement que de 50% des profits pétroliers de son propre sol. Quatre

décennies après l'indépendance, Le New York Times (22 décembre 2002) indique que "40% du revenu pétrolier revient à Chevron, [et] 60% au gouvernement [nigérien]."

En comparaison, les Etats-Unis ne permettraient jamais à une compagnie pétrolière nigérienne de garder 40% des bénéfices d'un gisement de pétrole du Texas.

Nos pays africains ont payé un prix extraordinaire par manque de connaissance en matière de technologie domestique.

En raison de ce manque de connaissance, depuis l'indépendance en 1960, le Nigeria a abandonné 40% de ses gisements de pétrole et 200 milliards d'euros aux actionnaires américains et européens.

En raison de ce manque de connaissance, le Nigeria exporte le pétrole brut, pour importer du pétrole raffiné.

En raison de ce manque de connaissance, l'Afrique exporte du métal brut, pour importer des voitures qui sont essentiellement des produits en métal.

La connaissance est le moteur de la croissance économique, et l'Afrique ne peut pas éliminer la pauvreté sans d'abord accroître et consolider son capital intellectuel.

Inverser la "fuite des cerveaux" augmentera le capital intellectuel de l'Afrique tout en augmentant sa richesse de plusieurs manières.

La "fuite des cerveaux" peut-elle être renversée ? Ma réponse est : oui. Mais pour que cela se produise, nous devons essayer quelque chose de différent.

A cet instant de la discussion, je souhaite proposer une nouvelle idée. Pour que cette idée fonctionne, elle exige que nous puissions parmi les talents et les compétences de la Diaspora africaine. Elle exige que nous créions un million d'emplois qualifiés en Afrique. Elle exige que nous transférons un million de postes qualifiés des Etats-Unis vers l'Afrique.

Je sais que vous vous demandez : Comment pouvons-nous transférer un million d'emplois des Etats-Unis vers l'Afrique ?

C'est possible. En fait, en 2015 le département du travail des Etats-Unis estime une perte d'environ 3,3 millions d'emplois dans les centres d'appel en faveur des pays en voie de développement.

Dans ce secteur, en tant qu'africain nous devons développer une stratégie - qui persuadera les multinationales qu'il est plus profitable de déplacer leurs centres d'appel dans des pays en Afrique plutôt qu'en Inde.

Ces postes qualifiés incluent ceux des centres d'appel, du service clientèle et du support technique - et conviennent aux diplômés qui n'ont pas trouvé d'emploi.

La raison pour laquelle ces emplois peuvent maintenant émerger en Afrique est que les récents progrès technologiques tels que l'Internet et les téléphones portables rendent maintenant ces emplois adaptables, meilleurs marchés et il est avantageux de déplacer ces services dans des pays en voie de développement, où les bas salaires règnent.

Si l'Afrique réussit à canaliser un million de ces emplois qualifiés, ils

pourraient fournir plus de revenus que tous les gisements de pétrole africains. Ces "verts pâturages" encourageraient le retour des compétences et, alternativement, inverseraient la "fuite des cerveaux."

Mieux, nous avons une occasion unique de transformer les pertes prévues d'emplois américains en nouveaux emplois pour l'Afrique, et changer ainsi la "fuite des cerveaux" en "profit des cerveaux."

Cependant, des mesures concrètes doivent être menées avant que cette occasion ne s'envole. L'Inde n'est pas un concurrent facile.

Par conséquent, nous devons déterminer les économies réalisées en sous-traitant les centres d'appel en Afrique plutôt qu'en Inde. L'économie à réaliser sera utilisée comme argument de vente auprès des sociétés souhaitant recourir à la sous-traitance.

Un employé typique de centre d'appel pourrait être une femme au foyer munie d'un ordinateur et d'un téléphone portable travaillant

à partir de son domicile. Alors que la nuit tombe et que ses enfants vont au lit, elle pourrait passer un appel téléphonique à Los Angeles, où il est 10 heures de moins.

Un Américain répond à son appel et elle dit, "bonjour, Zakiya à l'appareil." En utilisant une trame de dialogue, un guide préparé, elle essaye de vendre un produit américain.

Maintenant que les appels téléphoniques des Etats-Unis vers l'Afrique atteignent à peine 6 centimes la minute, il est possible économiquement qu'une télévendeuse habite en Afrique anglophone en étant virtuellement employé aux Etats-Unis, et - ceci est important - qu'il paye ses impôts sur le revenu uniquement à son pays en Afrique.

Je donnerai un exemple supplémentaire sur la façon dont des milliers d'emplois en centre d'appel peuvent être créés en Afrique.

On sait que les compagnies américaines abandonnent les dettes impayées de moins de 50\$ pour la simple et bonne raison

qu'il en coûterait 60\$ pour embaucher un américain afin d'en récupérer seulement 50.

En comparaison, je crois que cela coûterait seulement 10\$ d'embaucher un Africain (en tenant compte des 6 centimes la minute par appel) pour récupérer les dettes de 50\$.

Tout à l'heure, les organisateurs de cette Conférence Panafricaine m'ont remis onze questions.

La première était : Les Africains qualifiés ont-ils l'obligation morale de rester et travailler en Afrique ?

Je crois que ceux qui ont des compétences devraient être encouragés et récompensés pour rester, travailler, et élever leurs familles en Afrique. Quand cela arrivera, une grande bourgeoisie apparaîtra, réduisant de ce fait les conditions permettant la guerre civile et la corruption. Puis, une véritable régénérescence et une Renaissance se produiront.

La deuxième question était : Les émigrants africains qualifiés devraient-ils être obligés de retourner en Afrique ?

Je crois que le contrôle de l'émigration sera très difficile. Au lieu de cela, je propose que les Nations Unies impose "une taxe sur le profit des cerveaux (brain gain tax)" aux pays tirant bénéfice de la "fuite des cerveaux."

Chaque année, les Etats-Unis créent une fuite des cerveaux en délivrant 135 000 visas de type H1-B pour attirer les "chercheurs exceptionnels" et les personnes ayant "des capacités extraordinaires."

Il pourrait être exigé au Service des Recettes des Etats-Unis (IRS), fonctionnant conjointement avec le Service d'Immigration et de Naturalisation (INS), de verser un mois de salaire, par an, au pays natal de chaque immigré. Déjà, l'IRS permet au contribuable américain de financer de façon volontaire des fonds pour les élections. De même, l'IRS pourrait permettre à des immigrés de payer volontairement leurs impôts à leur pays natal, au lieu des Etats-Unis.

La troisième question était : Pourquoi n'encourageons-nous

pas les chômeurs Africains à chercher un emploi à l'étranger ? D'un autre point de vue, si toutes les infirmières et tous les médecins en Afrique devaient gagner à la loterie de visas américains, qui fera fonctionner nos hôpitaux ?

Si nous encourageons 8 millions d'Africains qualifiés à émigrer, qu'encouragerons-nous à faire à leurs 800 millions de frères et soeurs restants ?

La quatrième question était : Devons-nous tenir la Diaspora africaine pour responsable des problèmes de l'Afrique ?

Oui, la Diaspora devrait être tenue en partie pour responsable, parce que l'absence qu'elle a créé a fait chuter le capital intellectuel du continent et a ainsi créé le vide permettant à des dictateurs et à la corruption de s'épanouir. Les Idi Amin, Jean-Bedel Bokassa et Mobutu Sese Seko n'auraient pas pu se déclarer président à vie de pays disposant d'une bourgeoisie puissante et instruite.

La cinquième question était : Ne devrions-nous pas tenir pour

responsable les hommes politiques africains qui pillent les richesses de l'Afrique ?

Ça devient un cercle vicieux : la fuite des cerveaux entraîne la fuite des capitaux qui entraîne à son tour la fuite des cerveaux.

Le leadership est un processus collectif, et la "fuite des cerveaux" réduit l'intelligence collective requise pour combattre la corruption et la mauvaise gestion.

Par exemple, le conseil de la Banque Centrale du Nigeria n'a pas organisé une conférence d'informations suite au vol de 3 milliards de dollars par Sani Abacha.

Le gouverneur général de la Banque Centrale n'a pas fait de grève de la faim. Il n'a pas déposé de plainte pour vol à la police. Il n'a pas intenté de procès.

Ils auraient eu la main d'œuvre intellectuelle pour lutter contre la corruption, les résultats auraient été très différents.

La sixième question était : Est-il possible de réaliser une Renaissance africaine ?

Puisque par définition, une Renaissance est la renaissance et la fleuraison des arts, de la littérature et des sciences, elle doit être précédée par une croissance du capital intellectuel du continent, ou de la connaissance collective du peuple.

Les meilleurs musiciens africains habitent en France. Les meilleurs auteurs africains vivent aux Etats-Unis ou en Grande-Bretagne. Les superstars du football habitent en Europe. Il sera impossible de réaliser une Renaissance sans leurs contributions.

La septième question était : Depuis combien de temps le problème "de la fuite des cerveaux" dure-t-il ? Une fausse idée commune est de croire que la "fuite des cerveaux" africains a commencé il y a 40 ans.

En réalité, elle a commencé réellement il y a dix fois plus longtemps. Il y a quatre cents ans, la plupart des personnes d'ascendance africaine vivait en

Afrique. Aujourd'hui, un cinquième des personnes d'ascendance africaine vit en Amériques. Par conséquent, chiffre à l'appui, la plus grande "fuite des cerveaux" a résulté du commerce transatlantique d'esclave. Contrairement à ce que les gens croient, l'Afrique a connu un "profit des cerveaux" durant la première moitié du 20ème siècle. Des écoles, des hôpitaux et des banques ont été construits par les colonialistes britanniques. Ces établissements étaient les manifestations évidentes du "profit des cerveaux".

À la fin de la période coloniale, les Européens qualifiés ont quitté le continent. Les Africains qualifiés ont commencé à se sauver du continent dans les années 70, 80, et 90. Le résultat en a été une large augmentation des pratiques despotiques.

La huitième question était : La "fuite des cerveaux" est-elle une forme d'esclavage moderne ?

Vers la fin du 21ème siècle, les gens auront des sensibilités différentes et la décriront comme

un esclavage moderne. Au 19ème siècle, qui fut une ère agricole, l'économie américaine a eu besoin de mains fortes pour cultiver le coton, et les jeunes et vigoureux furent réduits en esclavage.

Au 21ème siècle, qui est une ère de l'information, l'économie américaine a besoin de personnes ayant "des capacités extraordinaires" et les meilleurs et les plus brillants sont embobinés avec des cartes vertes. Les Africains qui sont illettrés ou atteints du SIDA se voient automatiquement refuser le visa américain.

La neuvième question était : Croyez-vous que la "fuite des cerveaux" peut être inversée ?

Comme je l'ai dit tout à l'heure, la "fuite des cerveaux" est un problème complexe et multidimensionnel qui peut être transformé en un "profit des cerveaux."

L'Inde inverse maintenant sa "fuite des cerveaux," et la transforme en "profit des cerveaux ;" Je crois que l'Afrique peut faire la même chose.

Mais tant que nous ne l'inverserons pas, le rêve d'une Renaissance africaine demeurera insaisissable. La dixième question était : Pouvons-nous tenir la globalisation comme responsable de la fuite des cerveaux ?

La globalisation a commencé il y a 400 ans par le commerce transatlantique d'esclave qui a déplacé les ancêtres de 200 millions d'Africains vivant aujourd'hui en Amérique. Elle a accéléré parce que Internet et le téléphone portable vous permettent maintenant de communiquer instantanément avec n'importe quelle personne sur la planète.

De façon générale, la globalisation est une force qui dénationalise la richesse des pays en voie de développement. Les économistes ont montré que les pays riches deviennent plus riches tandis que les pauvres deviennent plus pauvres.

Nous savons également que le processus de globalisation augmente les dettes extérieures des pays en voie de

développement, accélérant la fuite du capital financier et intellectuel vers les pays occidentaux.

Les économies découlant de la délocalisation forceront les multinationales à sous-traiter dans les pays en voie de développement où les bas salaires règnent.

Pour rester concurrentielles et profitables, les entreprises seront forcées de réduire leurs coûts en embauchant des informaticiens à cinq dollars de l'heure vivant dans des pays du tiers monde et de licencier les programmeurs américains trop chers qui exigent cinquante dollars de l'heure.

A long terme, les délocalisations renverseront la fuite du capital financier et intellectuel des pays occidentaux vers le tiers monde.

La onzième question était : Pourquoi ai-je vécu aux Etats-Unis pendant 30 années et ne suis-je pas revenu ? L'Afrique me manque depuis que j'en suis parti. Mes racines sont toujours en Afrique. Ma maison est remplie de toute sorte de chose - nourriture,

peintures, musique, et vêtements - pour me rappeler l'Afrique.

J'avais très envie de visiter la terre mère, mais je dois avouer que lorsque l'Afrique m'a appelé pour revenir à la maison, je ne pouvais pas répondre à cet appel.

La raison en est que je travaille sur la création de nouvelles connaissances qui pourraient être employées pour reconcevoir les super ordinateurs. Les super ordinateurs les plus puissants coûtent 120 millions de dollars à la pièce et le Nigeria ne pourrait pas avoir les moyens de m'en acheter un. J'ai rendu possible l'exploitation de la puissance des milliers de processeurs ; cette invention, à son tour, a inspiré la redécouverte des vecteurs de super ordinateurs mis massivement en parallèles.

Les nouvelles connaissances doivent précéder de nouveaux produits technologiques et le super ordinateur d'aujourd'hui deviendra l'ordinateur individuel de demain.

Et pour répondre à votre question : même si je réside aux Etats-Unis,

I Speak for Africa

la connaissance que j'ai créé se matérialise aujourd'hui dans les meilleurs ordinateurs individuels achetés par les Africains.

En conclusion, des millions d'emploi très qualifiés peuvent être occupés en Afrique, mais peuvent à la place être perdus en Inde. Nous devons identifier les millions

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d'emploi qui seront plus profitables en Afrique qu'aux Etats-Unis.

De cette manière, cela nous permettra de créer une fuite des cerveaux des Etats-Unis et de la transformer en un profit des cerveaux pour l'Afrique. Merci encore.

[Bengali](#) and [German](#) translations provided by [High I.Q. for Humanity](#)

Globalization Not New; Look at Slave Trade

by Philip Emeagwali

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Globalization - or the ability of many people, ideas and technology to move from country to country - is not new. In Africa, it was initiated by the slave trade and given impetus by colonialism and Christian missionaries. The early missionaries saw African culture and religion as a deadly adversary and as an evil that had to be eliminated. In 1876, a 27-year-old missionary named Mary Slessor emigrated from Scotland to spend the rest of her life in Nigeria. For her efforts in trying to convert the people of Nigeria, Mary Slessor's photograph appears on Scotland's ten pound note, and her name can be found on schools, hospitals and roads in Nigeria.

The introduction to Mary Slessor's biography titled: "White Queen of the Cannibals" is revealing:

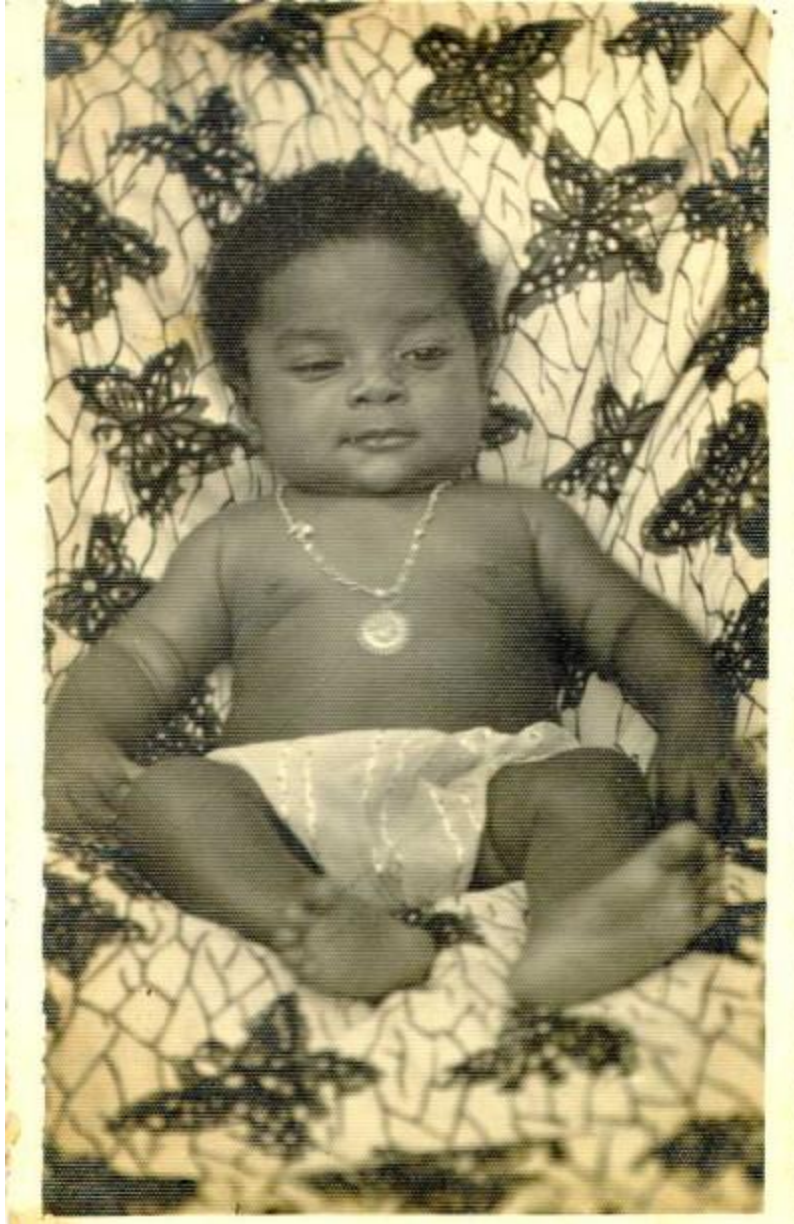
“On the west coast of Africa is the country of Nigeria. The chief city is Calabar,” said Mother Slessor. “It is a dark country because the light of the Gospel is not shining brightly there. Black people live there. Many of these are cannibals who eat other people.”

“They’re bad people, aren’t they, Mother?” asked little Susan.

“Yes, they are bad, because no one has told them about Jesus, the Saviour from sin, or showed them what is right and what is wrong.”

These opening words clearly show that Mary Slessor came to Africa on a mission to indoctrinate us with Christian theology. She told us we worshipped an inferior god and that we belonged to an inferior race. She worked to expel what she described as “savagism” from our culture and heritage and to encourage European “civilization” to take root in Africa.

We accepted the mission schools which were established to enlighten us, without questioning the unforeseen costs of our so-called education. These mission schools plundered our children's self-esteem by teaching them that, as Africans they were inherently "bad people." Our children grew up not wanting to be citizens of Africa. Instead, their education fostered the colonial ideal that they would be better off becoming citizens of the colonizing nations.



My baby photo

(Bright Studio, Palefa Street, Akure, Western Region, Nigeria. Circa November 1954)

I speak of the price Africans have paid for their education and “enlightenment” from personal experience. I was born “Chukwurah,” but my

missionary schoolteachers insisted I drop my “heathen” name. The prefix “Chukwu” in my name is the Igbo word for “God.” Yet, somehow, the missionaries insisted that “Chukwurah” was a name befitting a godless pagan. The Catholic Church renamed me “Philip,” and Saint Philip became my patron and protector, replacing God, after whom I was named.

I have to argue that something more than a name has been lost. Something central to my heritage has been stripped away. This denial of our past is the very antithesis of a good education. Our names represent not only our heritage, but connect us to our parents and past. As parents, the names we choose for our children reflect our dreams for their future and our perceptions of the treasures they represent to us.



The church I was baptized as "Philip." I was baptized by Reverend Father William Obelagu at Saint Mary's in November 1954.

My indoctrination went far deeper than just a name. The missionary school tried to teach me that saints make better role models than scientists. I was taught to write in a new language. As a result, I became literate in English but remain illiterate in Igbo - my native tongue. I learned Latin—a dead language I would never use in the modern world—because it was the official language of the Catholic Church, which owned the schools I attended.

Today, there are more French speakers in Africa than there are in France. There are more English speakers

in Nigeria than there are in the United Kingdom. There are more Portuguese speakers in Mozambique than there are in Portugal. The Organization of African Unity never approved an African language as one of its official languages.

We won the battle of decolonizing our continent, but we lost the war on decolonizing our minds.

Many acknowledge that globalization shapes the future, but few acknowledge that it shaped history, or at least the world's perception of it. Fewer acknowledge that globalization is a two-way street. Africa was a colony, but it is also a key contributor to many other cultures, and the cornerstone of today's society.



My mother (Agatha Emeagwali, left front row) and her friends --- Mabel Ifejika, Clara Chude, Modupe. (Burutu, Nigeria. Circa April 1958)

The world's views tend to overshadow and dismiss the value and aspirations of colonized people. Again, I must impart my own experiences to illustrate this point. I grew up serving as an altar boy to an Irish priest. I wanted to become a priest, but ended up becoming a scientist. Religion is based on faith, while science is based on fact and reason—and science is neutral to race. Unfortunately, scientists are not neutral to race.

Take, for example, the origin of AIDS, an international disease. According to scientific records, the first person to die from AIDS was a 25-year-old sailor named David Carr, of Manchester, England. Carr died on August 31, 1959, and because the disease that killed him was then unknown, his tissue samples were saved for future analysis. The “unknown disease” that killed David Carr was reported in *The Lancet* on October 29, 1960. On July 7, 1990, *The Lancet* retested those old tissue samples taken from David Carr and reconfirmed that he had died of AIDS. Based upon scientific reason, researchers should have deduced that AIDS originated in England, and that David Carr sailed to Africa where

he spread the AIDS virus. Instead, the white scientific community condemned the British authors of those revealing articles for daring to propose that an Englishman was the first known AIDS patient.

If these scientists were neutral to race, their data should have led them to the conclusion that Patient Zero lived in England. If these scientists were neutral to race, they should have concluded that AIDS had spread from England to Africa, to Asia, and to America. Instead, they proposed the theory that AIDS originated in Africa.

Even history has degraded our African roots. We come to the United States and learn a history filtered through the eyes of white historians. And we learn history filtered through the eyes of Hollywood movie producers. Some of us complained that Hollywood is sending its distorted message around this globalized world. Some of us complained that Hollywood is a cultural propaganda machine used to advance white supremacy. George Bush understood Hollywood was

a propaganda machine that could be used in his war against terrorism. Shortly, after the 9/11 bombing of New York City, Bush invited Hollywood moguls to the White House and solicited their support in his war against terrorism.

Some will even argue that schools play a significant role as federal indoctrination centers used to convince children during their formative years that whites are superior to other races. Fela Kuti, who detested indoctrination, titled one of his musical albums: “Teacher Don't Teach Me Nonsense.” It scares me that an entire generation of African children is growing up brainwashed by Hollywood’s interpretation and promotion of American heroes. Our children are growing up idolizing American heroes with whom they cannot personally identify.

We need to tell our children our own stories from our own perspective. We need to decolonize our thinking and examine the underlying truths in more than just

movies. We need to apply the same principles to history and science, as depicted in textbooks.

Look at African science stories that were retold by European historians; they were re-centered around Europe. The earliest pioneers of science lived in Africa, but European historians relocated them to Greece. Science and technology are gifts ancient Africa gave to our modern world. Yet, our history and science textbooks, for example, have ignored the contributions of Imhotep, the father of medicine and designer of one of the ancient pyramids.

The word “science” is derived from the Latin word “*scientia*” or “possession of knowledge.” We know, however, that knowledge is not the exclusive preserve of one race, but of all races. By definition, knowledge is the totality of what is known to humanity. Knowledge is a body of information and truth, and the set of principles acquired by mankind over the ages. Knowledge is akin to a quilt, the latter consisting of several layers held together by stitched designs and

comprising patches of many colors. The oldest patch on the quilt of science belongs to the African named Imhotep. He was the world's first recorded scientist, according to the prolific American science writer Isaac Asimov. The oldest patch on the quilt of mathematics belongs to another African named Ahmes. Isaac Asimov also credited Ahmes as being the world's first author of a mathematics textbook.

Therefore, a study of history of science is an effort to stitch together a quilt that has life, texture and color. African historians must insert the patches of information omitted from books written by European historians. There are many examples of the mark Africans have made on world history.

Americans are surprised when I tell them Africans built both Washington's White House and Capitol.

According to the US Treasury Department, 450 of the 650 workers who built the White House and the Capitol were African slaves. Because the White House and Capitol are the two most visible symbols of American

democracy, it is important to inform all schoolchildren in our globalized world that these institutions are the results of the sweat and toil of mostly African workers. This must also be an acknowledgement of the debt America owes Africa.

Similarly, discussions of globalization should credit those Africans who left the continent and helped build other nations throughout the world - most nations on Earth. Africans who have made contributions in Australia, in Russia, and in Europe must be acknowledged so our children can have heroes with African roots - so they can know their own roots and be proud of them.

The enormous contributions of Africans to the development and progress of other nations has gone unacknowledged. We have yet to acknowledge, for example, that St. Augustine, who wrote the greatest spiritual autobiography of all time, called "Confessions of St. Augustine," was an African; that three Africans became pope; that Africans have lived in Europe since

the time of the Roman Empire; that **Septimus Severus, an Emperor of Rome, was an African**; and that the reason Beethoven was called “The Black Spaniard” was because he was a mulatto of African descent. Why are we reluctant to acknowledge the contributions and legacies of our African ancestors? We cannot inspire our children to look toward the future without first reminding them of their ancestors’ contributions.

Look at the long struggle of African Australians, who recently became citizens with rights on their native continent. Africans have been living in Australia for 50,000 years. Yet, African Australians were granted Australian citizenship just 42 years ago, in 1967. According to *CNN*, African Australians were not recognized as human beings prior to 1967. They “were governed under flora and fauna laws.” African Australians were, in essence, governed by plant and animal laws. For many years, African Australians were described as the “invisible people.” In fact, the first

whites to settle in Australia named it the “land empty of people.”

The contributions of Africans to Russia must be reclaimed. Russia's most celebrated author, A.S.(Aleksandr Sergeyevich) Pushkin, told us he was of African descent. Pushkin's great-grandfather was brought to Russia as a slave. Russians proclaim Pushkin as their “national poet,” the “patriarch of Russian literature” and the “Father of the Russian language.” In essence, Pushkin is to Russia what Shakespeare is to Britain. Yet Africans who have read the complete works of Shakespeare are not likely to have read a single book by Pushkin.

I was asked to share today the story behind my supercomputer discovery. It would require several books to tell the whole story, but I will share a short one that I have never told anyone. The journey of discovery to my supercomputer was a titanic, one-man struggle. It was like climbing Mount Everest. On many occasions I felt like giving up. Because I was

traumatized by the racism I had encountered in science, I maintained a self-imposed silence on the supercomputer discovery that is my claim to fame.

I will share with you a supercomputing insight that even the experts in my field did not know then and do not know now. In the 1980s, supercomputers could perform only millions of calculations per second and, therefore, their timers were designed to measure only millions of calculations per second. But I was performing billions of calculations per second and unknowingly attempting to time it with a supercomputer timer, which was designed to measure millions of calculations per second. I assumed my timer could measure one-billionth of a second. It took me two years to realize my timer was off a thousand-fold.

I was operating beyond a supercomputer's limitations, but I did not know it. The supercomputer designers did not expect their timers to be used to measure calculations at that rate. I almost gave up because I

could not time and reproduce my calculations which, in turn, meant I could not share them, two years earlier, with the world.

After years of research, my supercomputer's timer was the only thing stopping me from getting the recognition I deserved. I realized the timer was wrong, but I could not explain why. I spent two years mulling over why the timer was wrong. It took two long and lonely years to discover why I could not time my calculations. My 3.1 billion calculations per second, which were then the world's fastest, were simply too fast for the supercomputer's timer.

What I learned from that experience was not to quit when faced with an insurmountable obstacle – and that believing in yourself makes all the difference. I learned to take a step backward and evaluate the options: Should I go through, above, under, or around the obstacle? Quitting, I decided, was not an option. Indeed, the old saying is true: When the going gets tough, the tough get going. Looking back, I learned

that most limitations in life are self-imposed. You have to make things happen, not just watch things happen. To succeed, you must constantly reject complacency. I learned I could set high objectives and goals and achieve them.

The secret to my success is that I am constantly striving for continuous improvements in my life and that I am never satisfied with my achievements. The myth that a genius must have above-average intelligence is just that, a myth. Geniuses are people who learn to create their own positive reinforcements when their experiments yield negative results. Perseverance is the key.

My goal was to go beyond the known, to a territory no one had ever reached. I learned that if you want success badly enough and believe in yourself, then you can attain your goals and become anything you want in life. [The greatest challenge in your life is to look deep within yourself to see the greatness that is inside you, and those around you.](#) The history books may

deprive African children of the heroes with whom they can identify, but in striving for your own goals, you can become that hero for them – and your own hero, too.

I once believed my supercomputer discovery was more important than the journey that got me there. I now understand the journey to discovery is more important than the discovery itself; that the journey also requires a belief in your own abilities. I learned that no matter how often you fall down, or how hard you fall down, what is most important is that you rise up and continue until you reach your goal. It's true, some heroes are never recognized, but what's important is that they recognize themselves.

It is that belief in yourself, that focus, and that inner conviction that you are on the right path, that will get you through life's obstacles. If we can give our children pride in their past, then we can show them what they can be and give them the self-respect that will make them succeed.

Transcribed from speech delivered by Philip Emeagwali [emeagwali.com] at the Pan-African Conference on Globalization, Washington, DC USA



Mary Slessor's photos on the front and back of Scotland's ten pound



Emeagwali speaking at the Pan-African Conference on Globalization, Washington, DC, September 18, 2004. Emeagwali helped give birth to the supercomputer - the technology that spawned the Internet. He won the 1989 Gordon Bell Prize, which has been dubbed the "Nobel Prize of Supercomputing." [Download](#) for your printer and website.



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Early Africans in America built the White House.



Early Africans in America built the Capitol.



Black Australians were treated as second-class citizens in their native continent.



An Australian.

Globalization - or the ability of many people, ideas and technology to move from country to country - is not new. In Africa, it was initiated by the slave trade and given impetus by colonialism and Christian missionaries.

The early missionaries saw African culture and religion as a deadly adversary and as an evil that had to be eliminated.

In 1876, a 27-year-old missionary named Mary Slessor emigrated from Scotland to spend the rest of her life in Nigeria.

For her efforts in trying to convert the people of Nigeria, Mary Slessor's photograph appears on Scotland's ten pound note, and her name can be found on schools, hospitals and roads in Nigeria.

The introduction to Mary Slessor's biography titled: "White Queen of the Cannibals" is revealing:

"On the west coast of Africa is the country of Nigeria. The chief city is Calabar," said Mother Slessor.

"It is a dark country because the light of the Gospel is not shining brightly there. Black people live there. Many of these are cannibals who eat other people."

"They're bad people, aren't they, Mother?" asked little Susan.

"Yes, they are bad, because no one has told them about Jesus, the Saviour from sin, or showed them what is right and what is wrong."

These opening words clearly show that Mary Slessor came to Africa on a mission to indoctrinate us with Christian theology.

She told us we worshipped an inferior god and that we belonged to an inferior race.

She worked to expel what she described as "savagism" from our culture and heritage and to encourage European "civilization" to take root in Africa.

We accepted the mission schools which were established to enlighten us, without questioning the unforeseen costs of our so-called education.

These mission schools plundered our children's self-esteem by teaching them that, as Africans they were inherently "bad people."



Mary Slessor's photos on the front and back of Scotland's ten pound note.

Our children grew up not wanting to be citizens of Africa. Instead, their education fostered the colonial ideal that they would be better off becoming citizens of the colonizing nations.

I speak of the price Africans have paid for their education and “enlightenment” from personal experience.

I was born “Chukwurah,” but my missionary schoolteachers insisted I drop my “heathen” name. The prefix “Chukwu” in my name is the Igbo word for “God.” Yet, somehow, the missionaries insisted that “Chukwurah” was a name befitting a

godless pagan.

The Catholic Church renamed me “Philip,” and Saint Philip became my patron and protector, replacing God, after whom I was named.

I have to argue that something more than a name has been lost. Something central to my heritage has been stripped away.

This denial of our past is the very antithesis of a good education.

Our names represent not only our heritage, but connect us to our parents and past.

As parents, the names we choose for our children reflect our dreams for their future and our perceptions of the treasures they represent to us.

My indoctrination went far deeper than just a name. The missionary school tried to teach me that saints make better role models than scientists.

I was taught to write in a new language. As a result, I became literate in English but remain illiterate in Igbo - my native tongue.



Emeagwali speaking at the Pan-African Conference on Globalization, Washington, DC, September 18, 2004. Emeagwali helped give birth to the supercomputer - the technology that spawned the Internet. He won the 1989 Gordon Bell

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I learned Latin - a dead language I would never use in the modern world - because it was the official language of the Catholic Church, which owned the schools I attended.

Today, there are more French speakers in Africa than there are in France.

There are more English speakers in Nigeria than there are in the United Kingdom.

There are more Portuguese speakers in Mozambique than there are in Portugal.

The Organization of African Unity never approved an African language as one of its official languages.

We won the battle of decolonizing our continent, but we lost the war on decolonizing our minds.

Many acknowledge that globalization shapes the future, but few acknowledge that it shaped history, or at least the world's perception of it. Fewer acknowledge that globalization is a two-way street.

Africa was a colony, but it is also a key contributor to many other cultures, and the cornerstone of today's society.

The world's views tend to overshadow and dismiss the value and aspirations of colonized people. Again, I must impart my own experiences to illustrate this point.

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Science and technology are gifts ancient Africa gave to our modern world.

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We cannot inspire our children to look toward the future without first reminding them of their ancestors' contributions.

Look at the long struggle of African Australians, who recently became citizens with rights on their native continent.

Africans have been living in Australia for 50,000 years. Yet, African Australians were granted Australian citizenship just 37 years ago, in 1967.

According to *CNN*, African Australians were not recognized as human beings prior to 1967. They "were governed under flora and fauna laws." African Australians were, in essence, governed by plant and animal laws.

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In essence, Pushkin is to Russia what Shakespeare is to Britain. Yet Africans who have read the complete works of Shakespeare are not likely to have read a single book by Pushkin.



The Afro-Russian poet Aleksandr Sergeyevich Pushkin (1799-1837) was killed during a duel fight.



Emeagwali, Onyeka Onwenu and Dale Emeagwali at the Pan-African Conference on Globalization, Washington, DC, September 18, 2004. Onyeka is a famous Nigerian singer. [Download](#) for your printer and website.



Bunmi Wellington, a conference organizer, presents Emeagwali with an award. [Download](#) for your printer and website.

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#

Philip Emeagwali

emeagwali.com

Hailed as "the Bill Gates of Africa" by then-president Bill Clinton, Philip Emeagwali is a war survivor and renowned pioneer of the supercomputer and the Internet. "The Web owes much of its existence to Philip Emeagwali," observed TIME magazine. CNN has called him "a father of the Internet."

He was born on August 23, 1954, in Nigeria. At an early age, he developed a love for mathematics and earned the nickname "Calculus." With two million others, Emeagwali fled persecution to the safety of Biafran refugee camps during Nigeria's 30-month civil war that began in July 1967, which killed one million people. He was conscripted into the Biafran army at age 14, won a scholarship to the United States at age 19.

In his adopted country, Emeagwali became fascinated with what he called the "HyperBall," a

theorized supercomputer equivalent to an idealized Internet. He began programming in 1974 and because he could not find a research laboratory interested in his HyperBall, he conducted research alone for 15 years, delving deeply into the deep connections between motion, calculus, and computing.

In 1989, he shocked the computing industry by winning singlehandedly, as an unknown, the Gordon Bell Prize, considered the "Nobel Prize of supercomputing." He reformulated Newton's Second Law of Motion as 18 "grand challenge" equations and algorithms and then re-created those as 24 million algebraic equations. By programming 65,000 processors to work as one seamless unit, he solved those 24 million equations at a speed of 3.1 billion calculations per second, setting three world records and garnering international headlines.

This discovery that 65,000 processors can solve a grand challenge defined as the 20 gold-ring problems in computing, in part, inspired the reinvention of

supercomputers as a union of vast numbers of processors communicating as an Internet. He is profiled in books on the history of the Internet because his discovery suggested a re-definition of the computer of the mid 21st century as "a device communicating as an Internet while computing with thousands of processors," instead of one.

By expanding the limits of computing, Emeagwali has helped to move humanity forward into the age of information, which prompted president Bill Clinton to extol him as "one of the great minds of the Information Age."

In his native Nigeria, he is hailed as national hero, his likeness appearing on the nation's postage stamps and on the continent's music videos. He has been cited in numerous polls and lists of history's greatest black achievers, by publications ranging from New African to Ebony.

Emeagwali has won city-wide tennis tournaments.

He is married to Dale, a prominent molecular biologist, and they have a son. He travels from Washington, D.C.

###

Wie können wird den „brain drain“ umkehren?

Hauptrede gehalten von Philip Emeagwali [emeagwali.com] auf der „Pan African Conference on Brain Drain“ in Elsay, Illinois (USA), am 24. Oktober 2003.

Ich danke Ihnen für die freundliche Vorstellung und dafür, dass Sie mich eingeladen haben, hier meine Gedanken über die Umkehr des „brain drain“ zu präsentieren.

Für 10 Millionen in Afrika geborene Emigranten verhält sich das Wort „Heimat“ synonymhaft zu „Vereinigte Staaten von Amerika“, „Großbritannien“ oder anderen

Staaten außerhalb des afrikanischen Kontinents.

Ich selbst habe in den letzten 30 Jahren dauerhaft in den Vereinigten Staaten gelebt. Mein letzter Besuch in Afrika

liegt 17 Jahre zurück.

Als ich Nigeria verließ, war ich traurig, weil ich meine Familie zurücklassen musste. Ich war mir sicher, dass ich acht Jahre später zurückkehren, vermutlich ein Igbo-Mädchen heiraten und dann den Rest meines Lebens wieder in Nigeria verbringen würde.

Aber vor 25 Jahren habe ich mich dann in eine Amerikanerin verliebt und sie drei Jahre später geheiratet. Somit war ich berechtigt, 35 meinen engsten Verwandten, darunter

meinen Eltern, all meinen Geschwister, Nichten und Neffen, Green Cards zuzusenden.

Diese Geschichte, wie ich 35 Menschen in die Vereinigten Staaten gebracht habe, dient als Beispiel, wie 10 Millionen begabter Menschen Afrika in den vergangenen 30 Jahren verlassen haben.

Wir kamen über Studenten-Visa in die USA, wurden dann zu ständigen Bewohnern und ließen uns schließlich einbürgern. Unser neuer Bürgerstatus half uns, Verwandte zu unterstützen und hat unsere Freunde auf die Idee gebracht, ebenfalls in die USA zu immigrieren.

10 Millionen Afrikaner bilden nun eine unsichtbare Nation, die außerhalb des afrikanischen Kontinents lebt. Obwohl sie unsichtbar ist, ist sie doch genauso bevölkert wie Angola, Malawi oder Zimbabwe. Wäre sie ein Staat mit festen Grenzen, hätte sie ungefähr das Bruttoinlandsprodukt Afrikas.

Obwohl die Afrikanische Union ihren afrikanischen Ableger nicht als Staat anerkennt, hat der Internationale Währungsfond (IWF) bereits seine wirtschaftliche Bedeutung erkannt. Der IWF schätzt, dass die Afrikaner außerhalb Afrikas mittlerweile die größte Gruppe ausländischer Investoren für den afrikanischen Kontinent darstellen. Western Union beispielsweise geht davon aus, dass es nicht untypisch für einen Immigranten ist, ungefähr 300\$ monatlich an die Verwandten in Afrika zu überweisen. Wenn man annimmt, dass die meisten der außerhalb Afrikas lebenden Afrikaner jeden Monat solche Summen überweisen und man ein wenig rechnet, so wird man dem IWF und seiner Schätzung sicherlich zustimmen.

Es erkennen nur wenige, dass in die USA eingewanderte Afrikaner 40mal so viel zur amerikanischen Wirtschaft beitragen wie zur afrikanischen. Laut den Vereinten

I Speak for Africa

© PHILIP EMEAGWALI

Nationen trägt ein gut ausgebildeter Afrikaner in den USA jährlich ungefähr 150.000\$ zur amerikanischen Wirtschaft bei.

Wenn man nun wieder rechnet, stellt man fest, dass ein gut ausgebildeter Afrikaner, der 300\$ monatlich nach Afrika überweist, 40 mal mehr zur Wirtschaft in den USA beiträgt, als zur Wirtschaft in Afrika.

Im Verhältnis betrachtet bedeutet das, dass pro 300 von ihm monatlich nach Afrika überwiesenen Dollar 12.000 Dollar monatlich durch ihn in die US-Wirtschaft fließen.

Viel wichtiger als irgendwelche Statistiken ist es aber, die Armut in Afrika zu beseitigen und nicht, sie durch Überweisungen an Verwandte kaum merklich zu lindern. Geld allein kann Armut nicht bekämpfen, denn selbst eine Million Dollar stellt an sich erstmal nur eine wertlose Zahl dar. Wahrer Wohlstand kann nicht an Geld gemessen werden, obwohl

wir Wohlstand und Geld oft miteinander verwechseln. Wenn alles so bliebe, wie es gegenwärtig ist, bliebe selbst wenn wir alles Geld der Welt nach Afrika schicken würden der Kontinent so arm wie bisher.

Fragt man einen Kranken danach, was Wohlstand bedeutet, wird er eine Antwort geben, die sich von der Antwort der meisten anderen Menschen stark unterscheiden dürfte. Wären Sie HIV-positiv, würden Sie sicherlich gerne eine Million Dollar gegen eine Heilung eintauschen wollen. Wenn Sie Ihrem Arzt Geld geben, wird er Ihnen helfen, Geld in Gesundheit, oder besser gesagt, in Wohlstand, umzuwandeln.

Geld kann Kindern nichts beibringen. Lehrer hingegen können das. Geld kann kein Strom in Ihr Haus bringen. Ingenieure aber können das. Geld kann kranke Menschen nicht heilen. Ärzte können das.

Weil nur das Humankapital eines Landes in wahren Wohlstand umgewandelt werden kann, ist dieses Humankapital viel wertvoller als die Finanzmittel es sind.

Vor ein paar Jahren hatte Zambia 1600 Mediziner. Heute hat Zambia nur noch 400 Mediziner. In Kenia bleiben nur 10% der dort ausgebildeten Schwestern, Pfleger und Ärzte. Ähnlich sieht es in Südafrika und Ghana aus.

Ich spreche hier auch über Erfahrungen von meinen Familienmitgliedern. Mein Vater opferte im Pflegedienst 25 Jahre seines Lebens dem nigerianischen Staat. Jetzt erhält er eine Rente in Höhe von 25\$ pro Monat.

Zum Vergleich: Meine Schwestern in den USA erhalten als Krankenschwestern einen Stundenlohn in Höhe von 25\$. Hätte mein Vater dieselben Möglichkeiten gehabt wie meine Schwestern, wäre er sicherlich bereits kurz nach Ende seiner Ausbildung in die USA eingewandert.

Der „brain drain“ erklärt teilweise, warum zahlungskräftige Afrikaner zu medizinischen Behandlungen nach London fliegen.

Außerdem können wir vernünftiger Weise schlussfolgern, dass afrikanische Ausbildungsstellen für Mediziner eigentlich eher dem amerikanischen Volk dienen als dem afrikanischen, da ein beträchtlicher Anteil afrikanischer Ärzte und Schwestern in amerikanischen Krankenhäusern tätig ist. Eine kürzlich von der Weltbank in Auftrag gegebene Umfrage zeigt, dass afrikanische Universitäten zahlreiche ihrer Absolventen in die USA exportieren. Die Weltbank schätzt, dass jedes Jahr 70.000 gut ausgebildete Afrikaner nach Europa und den USA auswandern.

Während aber diese 70.000 gut ausgebildeten Afrikaner auf der Suche nach Arbeit und annehmbaren Löhnen vom afrikanischen Kontinent flüchten, werden in Afrika 100.000

ebenso gut ausgebildete
Ausländer eingestellt, die Gehälter
gezahlt bekommen, die
Durchschnittseinkommen in
Europa
übersteigen.

Die Ölindustrie in Nigeria stellt
ungefähr 1.000 gut
ausgebildete Ausländer pro Jahr
ein, obwohl ähnlich
ausgebildete Arbeitskräfte auch in
der afrikanischen
Diaspora zu finden wären. Anstatt
eigene Arbeitskraft-
Ressourcen zu entwickeln
bevorzugt es Nigeria, die
Ölförderung im Inland durch
ausländische Unternehmen
vornehmen zu lassen, obwohl
deshalb 40% des Gewinns an die
Fremdfirmen abgetreten werden
muß.

In einer Ausgabe aus der Vor-
Unabhängigkeitszeit Nigerias
fragte Vanguard (Nigeria): „Warum
sollte der Optimismus von
1960 im Jahr 2000 in Verzweiflung
umschlagen?“

Meine Antwort lautet: Nigeria ist
seit 1960 zwar politisch
unabhängig, die technologische
Unabhängigkeit ist aber auch

bis zum Jahr 2000 noch nicht
erreicht.

Während der Kolonialzeit hat
Nigeria nur 50% des Gewinns
aus der inländischen Ölförderung
behalten. Vier Jahrzehnte
nach Ende der Kolonialzeit schrieb
die New York Times am
22. Dezember 2002, dass nun „40
Prozent des Öleinkommens
nach Chevron, [und] 60 Prozent an
die [nigerianische]
Regierung fließen.“

Zum Vergleich: Die USA würden
es niemals zulassen, dass
eine nigerianische Ölfirma 40%
der Gewinne eines
texanischen Ölfelds einstreicht.

Die Staaten Afrikas zahlten und
zahlen einen
außergewöhnlich hohen Preis für
den Mangel an inländischem
technologischem Wissen.

Aufgrund dieses Mangels
exportiert Nigeria Rohöl, nur um im
Gegenzug raffiniertes Öl
einzukaufen.

Aufgrund dieses Mangels
exportiert Afrika Stahl, nur um im
Gegenzug Autos zu importieren.

Wissen ist der Motor, der das wirtschaftliche Wachstum antreibt, und Afrika kann seine Armut nicht überwinden, ohne zu allererst sein intellektuelles Kapital zu vergrößern und zu ernähren.

Die Umkehrung des „brain drain“ wird Afrikas intellektuelles Kapital vergrößern, während sie gleichzeitig seinen Wohlstand auf viele verschiedene Arten vergrößern wird.

Und kann man man den „brain drain“ umkehren? Meine Antwort lautet: Ja. Aber damit dies geschehen kann, müssen wir etwas anderes probieren.

An dieser Stelle möchte ich gerne eine neue Idee in dieses Gespräch einbringen. Wenn diese Idee funktionieren soll, müssen wir die Talente und Begabungen der überall auf der Welt lebenden Afrikaner einsetzen. Wir müssen eine Million Hochtechnologiearbeitsplätze in Afrika schaffen. Wir müssen eine Million Hochtechnologiearbeitsplätze aus den USA nach

Afrika verlagern.

Ich weiß, dass Sie sich fragen, wie es möglich ist, eine Million Arbeitsplätze aus den Vereinigten Staaten nach Afrika zu verlagern.

Es *ist* möglich. Die für Arbeitsplatzprognosen zuständige Behörde in den USA geht in der Tat schon davon aus, bis zum Jahr 2015 ungefähr 3.3 Millionen Call Center – Arbeitsplätze an Entwicklungsländer zu verlieren. In diesem Bereich müssen wir Afrikaner eine Strategie entwickeln – eine Strategie, die multinationale Konzerne davon überzeugt, dass es profitabler sein wird, Call Center nach Afrika anstatt nach Indien zu verlegen.

Das angesprochene Feld der Hochtechnologiearbeitsplätze schließt Bereiche wie Call Center, Kundendienste und Betreuungsabteilungen ein – und all diese Bereiche sind passend für arbeitslose Universitätsabsolventen.

Die Grundlage für eine mögliche Verlagerung dieser Dienste nach Afrika liegt in den Entwicklungen der Technologie begründet. Internet und Mobiltelefonie machen es einfach, günstig und allgemein vorteilhaft, diese Dienste in Entwicklungsländer anzusiedeln, wo niedrigere Löhne gezahlt werden.

Falls Afrika Erfolg haben sollte und eine Million dieser Hochtechnologiearbeitsplätze erringen kann, könnten diese mehr Gewinn abwerfen als alle afrikanischen Ölfelder. Diese neuen Arbeitsplätze würden Talente zurück nach Afrika locken und einen umgekehrten „brain drain“ erzeugen. Ich wiederhole es noch mal: Wir haben die seltene und einzigartige Möglichkeit, vorhergesagte amerikanische Arbeitsplatzrückgänge in neue afrikanische Arbeitsplätze umzuwandeln und so den „brain drain“ in einen „brain gain“ zu verändern.

Allerdings müssen aggressive Maßnahmen ergriffen werden,

bevor diese Möglichkeit an uns vorbeigezogen ist. Indien ist ein ernstzunehmender Mitbewerber.

Deshalb müssen wir feststellen, wie hoch die Ersparnisse für Firmen wären, falls sie ihre Call Center in Afrika statt in Indien ansiedelten. Diese Ersparnisse werden dann als überzeugende Argumente eingesetzt werden können. Eine typische Call Center – Angestellte könnte beispielsweise eine Hausfrau mit Laptop und Mobiltelefon sein, die ihrer Arbeit von zu Hause aus nachgeht. Wenn abends ihre Kinder ins Bett gehen, könnte sie einen Anruf nach Los Angeles tätigen, welches sich zehn Stunden hinter ihrer eigenen Zeitzone befindet.

Ein Amerikaner nimmt den Anruf entgegen und sie sagt: „Guten Morgen, hier spricht Zakiya“. Mit einem standardisierten, geübten Text versucht sie, ein amerikanisches Produkt zu verkaufen.

Dieses Telefongespräch kostet ungefähr 6 cents pro Minute. Es ist ökonomisch einträglich für einen Telefonmarketer, im englischsprachigen Afrika niedergelassen zu sein, während er eigentlich in den USA tätig ist und – das ist wichtig – Einkommenssteuer nur an sein Land in Afrika abführt. Ich werde Ihnen ein weiteres Beispiel geben, wie tausende Call Center – Arbeitsplätze in Afrika geschaffen werden können.

Es ist allseits bekannt, dass amerikanische Unternehmen oftmals keine Zahlungsrückstände unter 50\$ mehr eintreiben. Das ist so, weil die Eintreibung von 50\$ ungefähr 60\$ Lohnkosten verursachen würde.

Ich schätze, dass es in Afrika nur rund 10\$ kosten würde, und zwar inklusive der 6 cents pro Minute für ein Telefongespräch, diese 50\$ Schulden einzufordern. Vorhin haben mir die Veranstalter der Pan Afrikanischen Konferenz ein Schreiben überreicht, welches 11 Fragen

enthält.

Die erste lautet: Haben ausgebildete Afrikaner die moralische Verpflichtung, in Afrika zu leben und zu arbeiten?

Ich glaube, diese Menschen sollte man dazu ermutigen und auch dafür belohnen, in Afrika zu wohnen, zu arbeiten und ihre Familien zu gründen. Falls das passiert, wird sich eine große Mittelschicht bilden, die all jene Einflüsse, die Bürgerkriegen und Korruption Vorschub leisten, reduzieren wird. Dann wird Afrika eine echte Wiederbelebung und Wiedergeburt erfahren.

Die zweite Frage lautet: Sollten ausgebildete afrikanische Emigranten verpflichtet werden, nach Afrika zurückzukehren? Ich bin der Ansicht, es dürfte sehr schwierig werden, die Emigration zu kontrollieren. Ich empfehle stattdessen den Vereinten Nationen, jene Staaten mit einer neuen Steuer zur Kasse zu bitten, die vom „brain drain“ profitieren.

Jedes Jahr erschaffen die USA einen „brain drain“, indem sie 135.000 Visa an „herausragende Wissenschaftler“ und Menschen mit „außergewöhnlichen Fähigkeiten“ ausstellen.

Das amerikanische Finanzamt IRS, das sehr eng mit der Einwanderungsbehörde INS zusammen arbeitet, könnte dazu verpflichtet werden, jedes Jahr einen Monatslohn eines jeden Immigranten an sein Geburtsland zu zahlen.

Schon jetzt erlaubt das US-Finanzamt amerikanischen Steuerzahlern, Gelder für Wahlkapital zu spenden. Ähnlich könnte man Immigranten erlauben, Steuergelder anstatt an die USA an ihr Geburtsland abzuführen.

Die dritte Frage lautet: Warum ermutigen wir nicht arbeitslose Afrikaner, im Ausland nach Arbeit zu suchen? Ich formuliere es anders: Wenn all unsere Pfleger und Ärzte die US Visa-Lotterie gewinnen, wer würde dann in unseren

Krankenhäusern arbeiten?

Wenn wir acht Millionen talentierte Afrikanern dazu ermutigen würden, zu emigrieren, wozu würden wir ihre übrigen 800 Millionen Brüder und Schwestern ermutigen?

Die vierte Frage lautet: Sollen wir den afrikanischen Emigranten die Schuld an Afrikas Problemen zuweisen?

Ja, teilweise sollte man das, da ihre Abwesenheit das intellektuelle Kapital Afrikas vermindert und somit das Vakuum geschaffen hat, in welchem Diktatoren und Korruption Fuß fassen konnten.

Menschen wie Idi Amin, Jean-Bedel Bokassa und Mobutu Sese Seko könnten sich niemals zu Präsidenten auf Lebenszeit ernennen, gäbe es in ihren Staaten eine große, gebildete Mittelschicht.

Die fünfte Frage lautet: Sollten wir nicht Afrikas Herrscher dafür schelten, dass sie afrikanische Gelder abzweigen?

Das wird zum Teufelskreis: Die Flucht des intellektuellen Kapitals verstärkt die Flucht des Finanzkapitals, welche wiederum die Flucht des intellektuellen Kapitals verstärkt. Die Führung eines Staates ist eine Angelegenheit der Gemeinschaft, und „brain drain“ mindert die gemeinschaftlichen geistigen Fähigkeiten, die benötigt werden, um Korruption und Missmanagement zu bekämpfen. Beispielsweise hat der Vorstand der nigerianischen Zentralbank keine Pressekonferenz einberufen, nachdem Sani Abacha der Bank drei Milliarden Dollar gestohlen hatte. Der verantwortliche Generaldirektor ist nicht in den Hungerstreik getreten. Er hat den Raub nicht der Polizei gemeldet. Er hat keine Anzeige erstattet.

Wären die intellektuellen Fähigkeiten zur Verhinderung von Korruption vorhanden gewesen, hätte der Vorfall sicherlich einen anderen Ausgang genommen.

Die sechste Frage lautet: Ist es möglich, in Afrika eine Renaissance einzuläuten?

Per Definition ist eine Renaissance das Wiederauferstehen und Erblühen der Künste, der Literatur und der Wissenschaften. Der Renaissance vorausgehen muss ein Wachstum des afrikanischen intellektuellen Kapitals oder des kollektiven Wissens.

Die besten afrikanischen Musiker findet man in Frankreich. Die besten Autoren leben in den USA oder Großbritannien. Die Fußballstars spielen in Europa. Eine Renaissance wird unmöglich sein, wenn Afrikas Talente nicht ihren Beitrag dazu leisten.

Die siebte Frage lautet: Seit wann gibt es das „brain drain“ – Problem?

Ein weit verbreiteter Irrglaube ist, dass der afrikanische „brain drain“ seinen Anfang vor 40 Jahren genommen hat. In Wirklichkeit hat er schon vor einer zehn mal so langen

Zeit begonnen. Vor 400 Jahren lebten die meisten afrikanischstämmigen Menschen in Afrika. Heute lebt ein Fünftel der afrikanischstämmigen Menschen irgendwo auf dem amerikanischen Kontinent. Darum kann man rein zahlenmäßig sagen, dass der größte „brain drain“ durch den transatlantischen Sklavenhandel verursacht wurde. Im Gegensatz zu dem, was viele Menschen glauben, hat Afrika in der ersten Hälfte des 20. Jahrhunderts einen „brain gain“ erlebt. Schulen, Krankenhäuser und Banken wurden durch die britische Kolonialmacht errichtet. Diese Institutionen waren die sichtbaren Manifeste des „brain gain“.

Am Ende der Kolonialzeit haben ausgebildete Europäer den afrikanischen Kontinent fluchtartig verlassen. Ausgebildete Afrikaner haben in den 1970ern, 80ern und 90ern angefangen, den afrikanischen Kontinent fluchtartig zu verlassen. Als

Ergebnis ergriffen überall auf dem Kontinent despotische Herrscher die Macht.

Die achte Frage lautet: Ist der „brain drain“ eine moderne Form der Sklaverei?

Am Ende des 21. Jahrhunderts wird der Mensch ein anderes Verständnis erreicht haben und ihn als moderne Sklaverei begreifen.

Im 19. Jahrhundert, dem Zeitalter der Landwirtschaft, benötigten die USA starke Hände, um Baumwolle zu pflücken und die jungen und starken wurden in die Sklaverei gezwungen.

Im 21. Jahrhundert, dem Informationszeitalter, benötigen die USA Menschen mit „außergewöhnlichen Fähigkeiten“ und die Besten und Schlauesten werden mit Green Cards angelockt. Analphabeten und HIV-Kranken aus Afrika wird das amerikanische Visum automatisch verwehrt.

Die neunte Frage lautet: Glauben Sie, dass der „brain drain“ umgekehrt werden kann?

Wie ich bereits vorhin erläutert habe, ist der „brain drain“ ein komplexes und vieldimensionales Problem, welches in einen „brain gain“ umgekehrt werden kann. Indien tut dies bereits. Ich glaube, dass Afrika ebenso dazu in der Lage sein kann. Aber solange wir ihn nicht umkehren, wird der Traum von der afrikanischen Renaissance unerfüllt bleiben.

Die zehnte Frage lautet: Können wir die Globalisierung als eine Ursache des „brain drain“ betrachten?

Die Globalisierung fand vor 400 Jahren im transatlantischen Sklavenhandel ihren Anfang, der die Vorfahren von 200 Millionen Afrikanern, die nun in Amerika leben, nach Übersee brachte. Sie hat sich beschleunigt, da Internet und Mobiltelefone jetzt die Möglichkeit bieten, in jedem Moment mit jeder beliebigen Person auf der Erde zu kommunizieren. Insgesamt betrachtet ist die Globalisierung eine Kraft,

welche den Wohlstand der Entwicklungsländer entnationalisiert. Wirtschaftswissenschaftler haben bestätigt, dass die reichen Staaten immer reicher, und die armen Staaten immer ärmer werden.

Wir wissen auch, dass der Globalisierungsprozess die Auslandsschulden der Entwicklungsländer in die Höhe treibt, was den Finanzfluss und den Fluss des intellektuellen Kapitals ins Ausland beschleunigt. Die wirtschaftlichen Bedingungen werden multinationale Konzerne dazu zwingen, ihre Tätigkeiten in Entwicklungsländer zu verlagern, wo die Lohnkosten niedriger sind.

Um konkurrenzfähig und profitabel bleiben zu können, werden die Unternehmen Programmierer einstellen müssen, die in der Dritten Welt leben und mit 5 Dollar pro Stunde zufrieden sind. Dafür werden sie teure amerikanische Programmierer

freisetzen, die für ihre Arbeit 50\$ pro Stunde verlangen.

Langfristig gesehen wird das Auslagern von Arbeitsplätzen den „brain drain“ umkehren und die Flucht von Geld und Arbeitskräften von westlichen Industrienationen in die Dritte Welt herbeiführen.

Die elfte Frage lautet: Warum haben Sie 30 Jahre am Stück in den USA gelebt?

Afrika hat an meiner Seele genagt, seit ich es verlassen

habe. Meine Wurzeln sind immer noch in Afrika. Mein Haus ist voll von Dingen aus Afrika, wie z.B. Essen, Bildern, Musik und Kleidung, um mich an Afrika zu erinnern.

Ich sehne mich danach, mein Vaterland zu besuchen, aber ich muss gestehen, dass ich nicht zurückkehren könnte, sollte Afrika nach mir rufen.

Der Grund dafür ist, dass ich daran arbeite, neues Wissen zu erschaffen, welches genutzt werden könnte, Supercomputer neu zu gestalten. Die stärksten Supercomputer kosten pro

Stück 120 Millionen \$ und Nigeria könnte es sich nicht leisten, mir ein solches Gerät zu kaufen. Ich habe Wissen geschaffen, welches es erlaubt, tausende Prozessoren zu verknüpfen. Dieses Wissen wiederum hat die Idee geboren, Vektor-Supercomputer in massiv parallel arbeitende Supercomputer zu verwandeln. Neuen technologischen Produkten muss stets neues Wissen vorausgehen. Der Supercomputer von heute wird der PC von morgen werden.

Und um nun auf Ihre Frage zu antworten: Auch wenn ich in den USA wohne, wird sich doch das Wissen, das ich geschaffen habe, in besseren PCs materialisieren, die wiederum von Afrikanern gekauft werden.

Abschließend möchte ich Ihnen mit auf den Weg geben, dass die Millionen von Hochtechnologieaufträgen, die von Afrika aus durchgeführt werden könnten, möglicherweise an Indien

verloren gehen können. Wir müssen diese Millionen von Arbeitsplätzen identifizieren, die mehr Profit bringen, wenn sie von den USA nach Afrika verlagert würden. Gelingt uns das, so werden wir einen „brain drain“ aus den

USA erschaffen können, der dann zu einem „brain gain“ für Afrika wird.

Ich möchte Ihnen nochmals danken.

BIOGRAPHIE

Philip Emeagwali hat 1989 den Gordon-Bell-Preis gewonnen, der auch als „Supercomputing-Nobelpreis“ bekannt geworden ist. Emeagwali fand eine Formel, mit der Computer schneller als zuvor zu Ergebnissen kommen konnten – eine Entdeckung, die die Neuerfindung der Supercomputer in Gang gebracht hat. Der ehemalige U.S. Präsident Bill Clinton bezeichnete Emeagwali als „einen der besten Köpfe des Informationszeitalters“ und CNN nannte ihn „einen der Väter des Internet.“ Er ist der Wissenschaftler, nach dem online am häufigsten gesucht wird.

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**L'AFRIQUE DE L'EPOQUE, D'AUJOURD'HUI, ET DE
TOUJOURS**

**Conférence pour marquer le 50^{ème} anniversaire de
l'Indépendance de la République Fédérale du Nigeria**

Par le professeur Philip Emeagwali

MEDEF, 55 Avenue Bosquet, 75007 Paris, France

Souvenirs de l'Afrique coloniale

Accompagnez-moi à l'une des plus grandes célébrations à la fin de l'ère coloniale en Afrique. La date est le 1 octobre 1960. Le lieu est l'Afrique occidentale britannique. Le décor est un stade bondé dans la ville de la côte Atlantique de Sapele. Les écoliers agitent leurs drapeaux vert et blanc à l'honneur de la naissance du

Nigeria moderne, qui ne fait plus partie de l'Empire britannique.

J'ai six ans et je suis dans ce stade. Je ne me souviens pas de ce qui a été dit parce que le concept de colonialisme m'est abstrait à l'époque. Mais je me rappelle nettement un incident qui me fait pleurer ce jour-là. J'agite vivement mon drapeau, tout excité, et soudain, un petit dur sans visage s'en empare brusquement et disparaît dans la foule.

A Lagos lointain, l'Union Jack est abaissé. Le chef de l'Etat du Nigeria, la Reine de l'Angleterre, est détrôné et Monsieur Nnamdi Azikiwe devient le premier dirigeant noir du Nigeria.

Cinquante ans plus tôt, l'Union Jack jette son ombre sur tous les fuseaux horaires mondiaux, d'où le dicton, « le soleil ne se couche jamais sur l'Empire britannique ». Nous montrons alors notre fierté.

En faisant partie de l'Empire en célébrant « *Empire Day* » [« La Fête de l'Empire »], le 24 mai, l'anniversaire de la Reine Victoria, avec des défilés, des compétitions

sportives. Empire Day deviendra plus tard *Commonwealth Day* [La Fête du Commonwealth]

En tant qu'un pays, le Nigeria existe depuis 96 ans, mais elle est indépendante depuis 50 ans seulement. C'est-à-dire, juste un peu plus de la moitié de 96 ans. Nous devons examiner profondément

les 46 ans d'autorité coloniale sur le Nigeria et le Partage de l'Afrique par les Européens qui a commencé par la Conférence de Berlin en 1884 pour avoir des aperçus sur la façon d'organiser le cours que suivrait notre nation pendant les 50 prochaines années.

Pour comprendre son histoire, revendiquer son passé et faire en sorte que le peuple avance au 21^{ème} siècle, l'Afrique doit revenir sur le passé,

sur la Conférence de Berlin de 1884 et la Traite Atlantique qui s'étend sur quatre continents et quatre siècles. Cela nous permettra de comprendre comment nous sommes devenus 54 nations au lieu d'une.

Comme l'oiseau Sankofa, l'Afrique doit se tourner vers son passé pour pouvoir prédire son avenir. Elle doit savoir comment elle a évolué pour comprendre comment

elle peut être recréée. Son peuple doit savoir d'où elle vient pour savoir quelle direction elle prendra dans l'avenir.

La Conférence de Berlin c'est quand l'Afrique est divisé en environ 50 colonies et 1884 c'est la date à laquelle la carte moderne de l'Afrique est créée.

La Conférence de Berlin marque le début de l'Afrique moderne. En 1884, le programme est l'Afrique mais aucun Africain ne participe à la conférence.

Cette année, 2010, 17 nations africaines célèbrent leur 50^{ème} anniversaire de souveraineté et d'autorité post-coloniale.

Le chemin du Nigeria, comme celui de chaque autre nation africaine indépendante a commencé à la Conférence de Berlin, il y a 126 ans, sans qu'aucun Africain n'y participe. Si l'Afrique coloniale a pu être créé

à Berlin, alors l'Afrique de l'avenir pourra être créée au Beijing. Les nations qui créent du savoir technologique réinventent l'avenir et recréent l'Afrique.

Je crois qu'à la fin de ce siècle, un Africain sur deux vivra hors de l'Afrique. Il m'a été demandé : « Pourquoi vous êtes-vous exilé de l'Afrique pendant 37 ans? »

Autrement dit, « Pourquoi ne donnez-vous pas la conférence du Cinquantenaire à Abujà ?

Je ne me suis jamais rendu à Abujà. Je ne suis pas non plus chez moi à Washington D. C.

J'avais une relation asymétrique avec la science américaine. J'ai travaillé complètement hors des portières de la science et en tant qu'exclu avec un statut d'exclu. Je suis honoré mais je resterai à jamais un étranger en Amérique.

J'ai été honoré d'avoir raconté encore l'histoire de 330 ans sur la deuxième loi du mouvement, du tableau des contes au tableau noir, et à la carte mère, en reprogrammant 65,000 sous-ordinateurs pour calculer comme un superordinateur et communiquer comme un

Internet. Cela a fait que je sois mon ancêtre en physique, contemporain en mathématiques, et un descendant en matière de science de l'Internet.

J'ai également expliqué que j'étais confronté à l'habituel de façon inhabituelle.

J'étais une personne ordinaire prise dans une situation extraordinaire. J'ai décidé de marcher en avant et de rentrer chez moi, pas d'aller chez quelqu'un d'autre. Je suis resté en exil en Amérique, en me sentant chez moi dans mon aliénation d'une communauté blanche. Mes 37 ans de solitude m'ont permis de me ramasser et de trouver ma puissance.



[Philip Emeagwali](http://emeagwali.com) [emeagwali.com]

Souvenirs de l'Afrique coloniale – 2

Je suis né en 1954 à Akure, en Afrique coloniale. L'un de mes souvenirs les plus chéris de l'Afrique coloniale est l'un des pennies que j'avais reçu comme argent de poche pour déjeuner à la cantine scolaire.

Les pièces ressemblaient à Edouard VIII, qui devient roi d'Angleterre le 20 Janvier 1936. Elles avaient été battues en anticipation de son règne. Cependant, Edouard abdique son trône le 11 décembre de cette année-là, et ne pourra pas être couronné.

Il abandonne le Royaume britannique pour se marier avec l'amour de sa vie, une Américaine divorcée.

En 1960, un jour typique dans ma vie commence dans notre propriété à Yuroba Road à Sapele. Notre propriété est adjacente à l'Eagle Club [« Le Club de l'Aigle »] où je fais des courses pour des légendes de la musique comme des maîtres trompettistes comme E.T. Mensah, Eddy Okonta, et Zeal Onyia. Ils me donnent un penny pour acheter deux cigarettes et je rapporte la monnaie d'un demi-penny.

Certains matins, ma mère me donne un penny avec les instructions suivantes : « Achète du riz avec un quart d'un penny (*farthing*), des haricots avec un demi-penny, et rapporte-moi la monnaie d'un demi-penny ». Quand je raconte cette histoire à mon fils, Ijeoma, il m'interrompt d'habitude.

« Papa, tu ne peux pas avoir de la monnaie pour un penny ! »

Je lui montre alors une pièce de monnaie avec un trou au milieu, portant la tête du roi George V et battue en 1936 avec l'inscription, « un dixième d'un penny ». Le trou au centre est destiné à enfiler les pièces de monnaie afin de les porter.

Le monde a beaucoup changé depuis mon enfance?

Le Nigeria existe depuis 96 ans et il a été indépendant pendant cinquante ans. Les Nigériens devront revenir sur les premiers 46 ans qu'ils ont passé sous l'autorité coloniale pour comprendre les cinquante années post-coloniales de leur autonomie. Regarder en arrière comme l'oiseau Sankofa, est nécessaire pour

comprendre la marche à suivre. L'autonomie est venue avec la responsabilité. Nous sommes maintenant jugés responsables de nos actes et de nos inactions, de nos coups d'Etat et de notre corruption, et de nos guerres civiles à Biafra, au Congo, au Rwanda.

Le fait de revenir sur les 96 ans, permettra au Nigeria de comprendre où et quand le train a déraillé et comment le remettre sur les rails.

Je crois que notre train a déraillé parce que les 46 années avant l'indépendance étaient une période de gains de cerveaux, alors que les cinquante années après l'indépendance ont été marquées par les pires fuites de cerveaux depuis la Traite Atlantique.

En regardant 50 ans en avant, je vois les nations qui contrôlent les technologies de l'information et de la communication diriger indirectement l'Afrique.

Je vois un téléphone portable, l'ordinateur, et l'Internet permettant à l'Afrique de remplacer la sélection avec l'élection. Je vois l'Internet permettant aux citoyens de devenir des reporters et décentraliser les médias. Je vois la technologie donnant à l'Afrique la possibilité

d'obtenir la liberté de la presse et la démocratie. Kwame Nkrumah a dit : « Le socialisme sans la science est nul ». Moi, je dis : « La démocratie sans technologie est nulle ».

Un scientifique peut être célèbre tout en restant inconnu. Le grand défi des scientifiques est de se concentrer sur des découvertes qui font réduire la pauvreté au lieu de gagner des prix. Se concentrer sur les prix que nous avons gagnés, et non sur les découvertes que nous avons faites reviendrait à dormir sur ses lauriers et ignorer son HEROÏSME.

Les découvertes et les inventions qui augmentent la richesse et réduisent la pauvreté constituent les « héros » en science et en technologie. Cent nations ont imprimé les portraits de leurs scientifiques vénérés sur leur monnaie. Cela a exalté ces scientifiques comme des porteurs des meilleures visions qu'ont leurs peuples sur eux-mêmes.

Veillez me permettre de répondre à une question qui m'a été posé. Qu'est-ce que vous avez contribué à la science et à la technologie ?

J'ai reformulé et résolu neuf équations différentielles qui figurent parmi les 20 grands défis de l'informatique. Les équations que j'ai inventées sont comparables aux équations iconiques de Navier-Stokes qui figurent parmi les sept problèmes du millénaire en mathématiques. Ces sept problèmes du millénaire sont aux mathématiques ce que les sept merveilles du monde sont à l'histoire. Pour être précis, les équations que j'ai résolues n'étaient pas exactement résolubles, mais elles étaient informatiquement résolubles.

C'est-à-dire que j'ai numériquement résolu la version du grand défi, et non celle du millénaire qui devrait être résolu logiquement.

Un romancier est un conteur, et un scientifique est un fabricant d'histoire. Un romancier crée un monde de fiction, mais un scientifique découvre des histoires factuelles de notre univers. Je suis un scientifique de l'Internet qui a découvert des histoires factuelles.

J'ai reprogrammé et réinventé un Internet pour raconter 65,000 histoires factuelles à autant de sous-ordinateurs. L'Internet subvient aux besoins fondamentaux de l'humanité – de calculer et de communiquer – et se

répand comme un feu de brousse, et résonne décennie après décennie. L'Internet est une technologie qui met les gens en communication et se connecte avec les gens d'une façon qui restera à jamais profonde et durable.

Je suis l'artiste qui a raconté des histoires sur comment les lois du mouvement ont mené aux vérités éternelles du calcul ; des vérités intemporelles qui vont survivre les opinions changeantes de tous les temps. Ma loi reformulée de la deuxième loi du mouvement est devenue mes empreintes de pied ; mes équations différentielles partielles reformulées sont devenues mes empreintes de main ; et mes algorithmes réinventés sont devenus mes empreintes digitales dans le sable du temps.

Je suis le physicien et le mathématicien qui a raconté une histoire dans laquelle une nouvelle technologie est née grâce à trois supports : un tableau des contes, un tableau noir et une carte mère. Mon conte a été raconté encore, des salles de conférences aux salles de rédaction, aux salles de classe, aux salles de séjour.

Tout a commencé comme un dialogue entre un programmeur d'un superordinateur et ses 65,000 sous-ordinateurs, qu'il a reprogrammé comme un Internet.

Pendant une conversation dans les langages de la physique et des mathématiques entre moi et mes machines en 1989, mon record du monde de 3,1 milliards de calculs par seconde a eu lieu quand mon clavier a remplacé l'écriture sur mon tableau noir and a réduit le fossé entre l'homme et la carte mère.

J'ai commencé à être connu grâce à la découverte qu'un superordinateur est un Internet et vice versa, et moi, le conteur, je suis devenu le conte et le témoin. Mon voyage à la frontière de la connaissance n'a pas commencé en Amérique. Il a commencé en 1960 en Afrique coloniale.



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Le Nigeria sans pétrole

Je remercie l'Ambassadeur Gordon Bristol de l'Ambassade du Nigeria de m'avoir invité à Paris, pour faire la conférence du cinquantième anniversaire de l'indépendance du Nigeria. Je devais revenir sur 1960, et regarder en avant, vers 2060, et partager mes connaissances sur les défis et les possibilités concernant la construction d'un Nigeria plus fort grâce à la technologie.

Au cours des 50 dernières années, le Nigeria est devenu plus fort économiquement par son utilisation de la technologie pour découvrir et récupérer du pétrole. Il y a cinquante ans, le Nigeria n'avait qu'un puits de pétrole. Cinquante ans après, ce premier puits de pétrole est vide et abandonné. Faites le calcul : « Combien de puits de pétrole resteront au Nigeria dans 50 ans ? »

Des puits de pétrole vides ne sont pas abstraites, intangibles.

Ils sont aussi concrets que les premiers puits de pétrole du Nigeria, le puits d'Oloibiri, qui n'existe que sur les

cartes postales. Nous traitons nos puits comme nous traitons les escargots : Nous prenons la chair et laissons la coquille. Et nous laissons la coquille à nos enfants qui, à leur tour, la laissent à leurs enfants qui auront des revenus en la transformant en une attraction touristique.

Des puits de pétrole qui ont cinquante ans se dessèchent partout, du Nigeria à l'Arabie Saoudite à la Russie. Peut-être que dans 50 ans, le Nigeria ne sera plus l'un des douze membres de l'Organisation des pays producteurs de pétrole.

Notre pétrole a été créé il y a des millions d'années, quand nos ancêtres pré-humains marchaient sur quatre pattes. Et aujourd'hui, nous avons découvert presque la totalité du pétrole découvrable. Pourtant, l'avenir du Nigeria est en train d'être écrit par ses quelques puits de pétrole.

Les revenus pétroliers représentent 80 pour cent du budget nigérian. La question persistante c'est : Que ferons-nous quand les 80 pour cent de pétrole seront épuisés. Quel est notre plan B quand notre plan A échoue. Chercher plus de pétrole n'est pas la réponse.

Ce sont des questions difficiles que nous préférons ignorer mais auxquelles nos enfants devront répondre.

Pour préparer nos futurs leaders pour « un monde sans pétrole », je conseille aux journaux et aux écoles de sponsoriser des concours de rédaction de poser la question : « Si vous êtes un éditeur qui a été informé que le dernier puits de pétrole au Nigeria a desséché, quels seraient vos gros titres et que diriez-vous dans vos éditoriaux ? »

J'ai posé la même question à mes amis qui m'ont envoyé par courriel les titres suivants :

1. « Le cygne est mort »
2. « La fin de la malédiction du Nigéria »
3. « Tanks de pétroles épuisés,
Cellules de réflexion demandées »

Je suis en train de former une cellule de réflexion pour aborder des questions futuristes, telles que :

«Quels sont les défis et les possibilités d'un Nigeria sans pétrole ?

La réponse se trouve dans notre tête. Si nous ne comprenons pas notre passé, nous ferons forcément des fautes. L'histoire de l'Afrique n'est pas que des faits poussiéreux et des images fanées.

Il était une fois, l'Afrique de l'Ouest était considérée comme l'égal de l'Europe en matière de capital intellectuel et de développement.

Dix siècles avant que Christophe Colomb ne parte à destination des Amériques, et que Mungo Park n'aille à la recherche de la source du Niger, Tombouctou est au premier plan de l'imagination des Européens comme l'un des endroits les plus mystérieux et les plus reculés sur terre. Tombouctou, qui émerge de la source du Niger, est une métaphore de la fin du monde ancien.

Tombouctou a été grand, non pas en raison de ses réserves de pétrole, mais grâce à sa capitale intellectuelle non surpassée, sa connaissance collective et la sagesse de son peuple.

Le Nigeria fera partie des 20 premières économies du monde pas à cause de ses revenus pétroliers mais en raison des connaissances intellectuelles des générations futures. Afin que le Nigeria fasse partie des 20 économies les plus importantes, il doit faire en sorte que sa fuite des cerveaux soit transformée en une acquisition de cerveaux.

Comme un centre d'excellence intellectuelle, Tombouctou attire les meilleurs cerveaux et inspire l'ancien proverbe de l'Afrique de l'Ouest :

« Le sel vient du nord,

L'or vient du sud

Et l'argent vient du pays de l'homme blanc, mais la parole divine et les trésors de la vérité se trouvent uniquement à Tombouctou.

Pour que le Nigéria construise le Tombouctou de demain et devienne une des vingt premières économies du monde, il doit contrôler des technologies critiques, et ne doit pas se contenter de les posséder. Le Nigéria a

besoin d'hommes et de femmes qui ont des idées, des visionnaires de la technologie et des futuristes, pour aider son peuple à répondre à une question plus vaste, à savoir, qui ils sont, d'où ils viennent et où ils aimeraient aller.

C'est grâce à la technologie maritime supérieure que le destin de l'Afrique est façonné au cours des 500 ans d'esclavage et de colonisation. L'esclavage conduit à la fuite des cerveaux qui est nécessaire pour le développement, tandis que la colonisation produit un gain en cerveaux.

Pendant que les Etats-Unis d'Amérique commencent à l'époque, à bénéficier de la fuite des cerveaux de l'Europe et de l'Afrique, Tombouctou est physiquement et intellectuellement pillé par des envahisseurs marocains et des marchands d'esclaves des Amériques. Tombouctou perd sa capitale humaine dont il a besoin pour le développement, et il ne se relèvera jamais en tant que centre d'excellence intellectuelle.

La technologie permettra au Nigeria de faire plus de choses avec peu de moyens, sans épuiser ses ressources naturelles, mais avec une demande et une dépendance plus grande de la technologie. C'est à nous de créer l'avenir, mais nous devons d'abord exposer les grandes lignes de notre vision.

Ce sont des fantassins, pas des généraux, qui mèneront notre guerre contre l'ignorance. Les fantassins sont notre 100 millions de jeunes Nigériens dont l'arme est la connaissance. Leur capitale intellectuelle collective leur permettra de construire un Nigeria plus fort en utilisant la connaissance technologique. Ma vision du cinquantenaire, c'est que le Nigeria exploite la créativité et l'innovation de notre jeunesse. Notre jeunesse est tout à fait capable d'édifier et de réinventer des techniques, des technologies et des outils nouveaux.

Notre voyage de découverte à la frontière de la science réaffirme le but de l'humanité de chercher sans

cesse des nouvelles connaissances, et de demander davantage pour elle-même et pour son peuple.



[Philip Emeagwali \[emeagwali.com\]](http://emeagwali.com)

Est-ce que le Nigeria peut sauter à saute-mouton dans l'âge de l'informatique ?

L'homme de sagesse est une lumière brillante qui jette la lumière sur notre obscurité et nous guide hors de notre ignorance.

On me demande souvent : « Comment pouvons-nous construire un Nigéria plus fort par l'innovation technologique ? »

J'ai trouvé la réponse en 1963, alors que j'étais assis à la véranda de notre maison à la rue Gbenoba, Agbor, dans la région du Midwest. J'étais en train de réciter une citation qui était dans le titre d'un journal, le *West African Pilot* [Pilote de l'Afrique de l'Ouest]. Voici les termes exacts de la citation : « Montrez la lumière et le peuple trouvera son chemin ».

Parce que j'avais neuf ans, je n'ai pas compris la signification profonde de ces mots de sagesse.

Maintenant, je comprends que « la lumière » était une métaphore de la connaissance, et « montrer la lumière » voulait dire augmenter la capacité intellectuelle, la somme de la connaissance humaine, possédée par 6.6 milliards d'hommes, femmes et enfants.

Nous trouverons «le chemin » quand nous aurons réalisé notre rêve d'éradiquer la pauvreté, de découvrir le remède contre le SIDA, et d'inventer l'Internet pour la communication par courriel.

Il y a longtemps, un homme demande à ses enfants,
« Si vous deviez choisir entre l'argile de la connaissance et un sac d'or, que choisiriez-vous ? »

« Le sac d'or, le sac d'or », crient les enfants NAÏFS, qui ne se rendent pas compte qu'avec la sagesse ils auraient la possibilité d'avoir beaucoup plus de sacs d'or dans l'avenir.

La richesse de l'avenir sera obtenue en développant le capital intellectuel – *l'argile de la sagesse*, et les innovations de la génération plus jeune pour rendre le Nigeria plus fort.

Est-ce que le Nigeria doit migrer du pétrole au sol, comme on l'a souvent suggéré.

Je ne le crois pas. Il doit sauter à saute-mouton dans l'âge de l'informatique. Le Nigeria ne peut pas retourner à un âge d'agriculture parce que l'Occident est en train d'être urbanisé, l'Orient est en train d'être érodé et le Nord est en train de subir la désertification.

Un Nigeria sans pétrole doit faire une transition vers une économie basée sur la connaissance. *Nollywood* peut redéfinir l'Afrique du 21^{ème} siècle comme le continent des arts et de l'innovation.

Si les Nigériens ont une moyenne de trois enfants par couple, il deviendra dans 50 ans, le troisième pays le plus peuplé du monde, derrière la Chine et l'Inde, mais il

aura une population plus dense. Où allons-nous trouver des terres arables ?

Les terres arables de mon grand-père se trouvaient là où le Marché d'Onisha se trouve actuellement. Pendant des siècles, mes ancêtres igbo étaient des agriculteurs.

Les fils marchaient sur le pas de leurs pères, en labourant les mêmes terres. Leur espérance de vie était d'environ 37 ans.

Les filles se mariaient tôt, et avaient autant d'enfants qu'elles pouvaient, et devenaient de jeunes veuves. Ma mère s'est mariée quelques jours après son 14^{ème} anniversaire et m'a donné le jour six jours après son 15^{ème} anniversaire.

Elle est née en Afrique coloniale, où elle comptait son âge sur ses doigts et ses orteils, et par son affiliation à sa tranche d'âge.

Cependant, elle a un fils qui peut compter les âges de l'humanité sur son superordinateur, qui occuperait l'espace de quatre cours de tennis.

Le superordinateur de son fils calcule, envoie et reçoit des informations, tout en envoyant et en recevant des courriers électroniques par 65 000 sous-ordinateurs.

Mon père et moi, suivis par mon fils, avons cassé la tradition de marcher sur les pas de nos ancêtres.

Mon père était un infirmier, et mon fils et moi-même sommes des scientifiques. Nous avons tous les trois abandonné le sol pour travailler dans les usines basées sur la connaissance.



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Africa Must Innovate

– Part 5 of 5

by [Philip Emeagwali](#)

Excerpt from Nigeria's 50th anniversary lecture at the Embassy of Nigeria, Paris.

Lecture video and audio are posted at <http://www.youtube.com/watch?v=mxU-izhbEWI> and emeagwali.com.

Le Nigeria a à peu près 50 ans de réserves de pétrole, si aucun nouveau gisement de pétrole n'est découvert. Dans un monde sans pétrole, la machette remplacera le tracteur agricole. Nous savons que la plupart des gisements de pétrole ont déjà été découverts et que le pétrole existe en quantités limitées.

Nous savons aussi que les puits de pétrole se tarissent après 50 ans. Au lieu de se demander quelle année exacte où le Nigeria viendra à manquer de pétrole, je préfère que nous imaginions que nous sommes déjà à court de pétrole. L'arrivée de ce jour est aussi certaine que la mort du gisement Olibiri.

Si le gisement numéro un du Nigeria est vide et abandonné, quel serait la fatalité de son gisement numéro mille ?

Cela pourrait venir plus tôt que n'importe qui d'entre nous ne pourrait s'y attendre. Nos héritiers nous remercieront ou nous maudiront pour la quantité de pétrole que nous leur aurons laissé.

Les découvertes scientifiques mènent à des inventions technologiques et sont des fondements de la connaissance : la connaissance qui doit précéder au développement de nouveaux produits, de nouveaux services, de nouvelles industries, de nouveaux emplois, et de nouvelles richesses.

Dans l'histoire humaine, le développement technologique et la croissance économique sont allées de pair. Une nation qui est sans égal en science est sans pareil en pouvoir économique. Le grand défi des scientifiques africains est de faire des découvertes et des

inventions qui peuvent être consacrées à l'intérieur du pays et diffusés dans l'économie du continent.

Son innovation et sa technologie qui créeront de nouveaux produits qui, à tour de rôle, créeront de nouvelles richesses qui réduiront la pauvreté. Pour dix gallons de pétrole dans nos gisements, trois seulement peuvent être récupérés. Ma découverte que l'Internet peut calculer, envoyer et recevoir des courriers électroniques est l'un des techniques, des technologies des outils innovateurs utilisés pour récupérer peut-être un pour cent des sept qui restent.

En 1989, alors que je résolvais l'un des grands défis en super-informatique, j'ai établi de nouveaux records du monde dans l'informatique et la communication. Cela a fait la une des journaux internationaux et moi, le mathématicien conteur est devenu le conte et le témoin.

J'ai battu ces records en reprogrammant et en réinventant un Internet comprenant 65 000 sous-ordinateurs pour calculer, mais aussi envoyer des

courriers électroniques à 65 000 adresses de courriers électroniques et en recevoir, et résoudre 24 million d'équations dont chacune reformule la loi de la physique à un record mondiale de vitesse de 3,1 milliards de calculs par seconde.

Ma conviction c'est qu'un scientifique doit être plus d'un témoin ; il ou elle doit être un homme ou un femme à idées, à la recherche constante de meilleures règles. Il y a toujours un espace pour de meilleures règles. J'ai reformulé et réduit la deuxième règle du mouvement en 18 équations et d'algorithmes, le lyrisme mathématique de la terre.

Ma découverte de ces équations et algorithmes ont fait la une des journaux. Un jour, j'ai reçu un appel téléphonique d'un mathématicien Américain qui travaille en Allemagne et qui avait lu des articles sur mes découvertes dans le journal de Wall Street en juin 1990. Je lui ai expliqué les équations de grands défis. J'ai inventé et j'ai résolu.

Au fond, et physiquement parlant, trois des six équations primitives, partielles et différentielles de la météorologie utilisées pour la météo aujourd'hui sont les mêmes que les neuf équations que j'ai inventées pour récupérer plus de pétrole des gisements ; et elles sont identiques aux équations de Navier-Stokes.

Pour lui, c'était un moment de « ah ah ». Il m'a bombardé de questions techniques. J'ai répondu :

« Elles sont les mêmes parce qu'elles émanent de la deuxième loi du mouvement en physique.

Elles sont des réaffirmations de calculs de la deuxième loi et elles sont réaffirmées comme de simples équations algébriques :

La force est égale à la masse fois l'accélération
Ou $F = ma$.

Il est devenu excité et m'a supplié de faire une conférence à Washington D. C. en juillet 1991 dans une session qu'il présidait lors d'un congrès sur les

mathématiques appliqués, organisé une fois tous les quatre ans.

Les dix mille personnes qui y ont assisté, comprenaient la plus grande assemblée des plus grands spécialistes de mathématiques au monde. J'étais consterné et je me suis dit : « Le premier livre scolaire de mathématiques fut publié par un Africain nommé Ahmes, il y a 3 700 ans. Et pourtant, un extra-terrestre assistant à cette conférence penserait qu'il n'y a pas de Noir dans notre planète ».

On me demande souvent de partager mes visions du futur et de prédire comment l'Internet pourrait être utilisé pour résoudre les problèmes de l'Afrique et créer de nouvelles possibilités pour son peuple. Ma réponse c'est que l'Internet accélérera encore la globalisation, qu'il transformera l'Afrique et que dans le monde globalisé du vingt-deuxième siècle, il y aura plus d'Africains hors de l'Afrique que d'Africains dans l'Afrique.

Lagos deviendra une métropole internationale et les Africains abandonneront leur vêtements traditionnels, leur cuisine, leurs jalons culturels, et ne seront pas plus africains que des Noirs britanniques ou des Noirs américains. Bon nombre d'Africains aura un héritage racial mixte, comme celui de Barak Obama.

Alors que je prédis cette tendance, je le mets aussi en doute. Est-ce que ce sera du progrès pour l'Afrique si celle-ci perd ce qui la rend unique ?

Ironiquement, le fait de développer une meilleure technologie européenne aussi l'identité africaine par la globalisation. Un exemple similaire historique peut être trouvé dans l'invention du compas, qui permet la traversée de l'Atlantique en bateau.

Cela engendrera la dévastatrice Traite Atlantique, qui commence en Afrique en août 1444.

Elle englobe quatre continents et dure quatre siècles. Elle déracine par la force des millions d'Africains

qui sont déportés aux Amériques. Elle prive les Africains de leurs langues, leurs cultures, et leur identité.

Cela conduit à la Diaspora Africaine, avec un Africain sur cinq s'installant aux Amériques.

Afrique doit innover ou périr

C'est à nous de construire l'avenir.
Mais d'abord, nous devons exposer les grandes lignes de notre vision.

Des fantassins, pas des généraux, mèneront la guerre contre l'ignorance. Les fantassins constituent un million de nos jeunes Nigériens dont l'arme est la connaissance. Leurs capitaux intellectuels leur permettront de construire un Nigeria plus fort en utilisant la technologie.

Ma vision du cinquantenaire c'est que le Nigeria doit exploiter la créativité de notre jeunesse. Ils ont la possibilité d'édifier l'humanité. La technologie se trouve

partout autour de nous et nous sommes constamment en train d'inventer et de réinventer.



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Ideas, Not Money, Alleviate Poverty
University of Alberta, Edmonton, Canada.

September 23, 2006

PHILIP EMEAGWALI

I once believed that capital was another word for money, the accumulated wealth of a country or its people.

Surely, I thought, wealth is determined by the money or property in one's possession. Then I saw a Deutsche Bank advertisement in the Wall Street Journal that proclaimed: "Ideas are capital. The rest is just money."

I was struck by the simplicity of such an eloquent and forceful idea. I started imagining what such power meant for Africa. The potential for progress and poverty alleviation in Africa relies on capital generated from the power within our minds, not from our ability to pick minerals from the ground or seek debt relief and foreign assistance.

If ideas are capital, why is Africa investing

more on things than on information, and more on the military than on education? Suddenly, I realized what this idea could mean for Africa. If the pen is mightier than the sword, why does a general earn more than the work of a hundred writers combined? If ideas are indeed capital, then Africa should stem its brain drain and promote the African Renaissance, which will lead to the rebirth of the continent. After all, a renaissance is a rebirth of ideas. And knowledge and ideas are the engines that drive economic growth.

When African men and women of ideas, who will give birth to new ideas, have fled to Europe and the United States, then the so-called African Renaissance cannot occur in Africa. It can only occur in Paris, London and New York.

There are more Soukous musicians in Paris than in Kinshasa; more African professional soccer players in Europe, than in Africa. African literature is more at home abroad than it is in Africa. In other words, Africans in Europe are alleviating poverty in Europe, not in Africa.

Until the men and women of ideas—the true healers of Africa—start returning home, the African Renaissance and poverty alleviation will remain empty slogans. After all, the brightest ideas are generated and harnessed by men of ideas.

The first annual report by J. P. Morgan Chase, a firm with assets of 1.3 trillion dollars, reads: "The power of intellectual capital is the ability to breed ideas that ignite value." This quote is a clarion call to African leaders to shift purposefully and deliberately from a focus on things to a focus on information; from exporting natural resources to exporting knowledge and ideas; and from being a consumer of technology to becoming a producer of technology.

For Africa, poverty will be reduced when intellectual capital is increased and leveraged to export knowledge and ideas. Africa's primary strategy for poverty alleviation is to gain debt relief, foreign assistance, and investments from western countries.

Poverty alleviation means looking beyond 100 percent Literacy and aiming for 100 percent numeracy, the prerequisite for increasing our technological intellectual capital.

Yet, in this age of information and globalization when poverty alleviation should result in producing valuable products for the global market and competing with Asia, the United States, and Europe—shamefully, diamonds found in Africa are polished in Europe and re-sold to Africans.

Philip Emeagwali

Part 1: Where is Africa Going Wrong?



Part 2

Out-of-the-Box Thinking
(in an In-the-Box World)

University of Alberta

Edmonton, Alberta, Canada.

September 23, 2006

PHILIP EMEAGWALI

The intellectual capital needed to produce products and services will lead to the path of poverty alleviation. Intellectual capital, defined as the collective knowledge of the people, increases productivity. The latter—by driving economic growth—alleviates poverty, always and everywhere, even in Africa. Productivity is the engine that drives global economic growth.

Those who create new knowledge are producing wealth, while those who consume it are producing poverty. If you attend a Wole Soyinka production of Chinua Achebe's "Things Fall Apart," you consume the knowledge produced by Soyinka and Achebe as well as the actor's production, much like I consume the

Knowledge and production of Bob Marley's through his songs.

We will need wisdom, that which turns too much information—or information overload—into focused power, not only to process, but also to evaluate the overwhelming amount of information available on the Internet. This wisdom will give us the competitive edge and enable us to find creative solutions.

The following story illustrates the difference between information and wisdom. Twelve hundred years ago, in the city of Baghdad, lived a genius named AL-Khwarizmi, who was one of the fathers of algebra. In fact, the word "algebra" comes from the title of his book "AL-jabr," which for centuries was the standard mathematics textbook.

AL-Khwarizmi taught in an institution of learning called the "House of Wisdom," which was the center of new ideas during Islam's golden age of science. To this day we computer scientists honor AL-Khwarizmi when we use the word "algorithm."

which is our attempt to pronounce his name

One day, Al-Khwarizmi was riding a camel laden down with algebraic manuscripts to the holy city of Mecca. He saw three young men crying at an oasis.

"My children, why are you crying?" he enquired.

"Our father, upon his death, instructed us to divide his 17 camels as follows:

"To my oldest son I leave half of my camels, my second son shall have one-third of my camels, and my youngest son is to have one-ninth of my camels."

"What, then, is your problem?" Al-Khwarizmi asked.

"We have been to school and learned that 17 is a prime number that is divisible only by one and itself and cannot be divided by two or three or nine. Since we love our camels, we cannot divide them

exactly," they answered.

Al-Khwarizmi thought for a while and asked,

"Will it help if I offer my camel and make the total 18?"

"No, no, no," they cried.

"You are on your way to Mecca, and you need your camel."

"Go ahead, have my camel, and divide the 18 camels amongst yourselves," he said, smiling.

So the eldest took one-half of 18—or nine camels. The second took one-third of 18—or six camels. The youngest took one-ninth of 18—or two camels. After the division, one camel was left: Al-Khwarizmi's camel, as the total number of camels divided among the sons (nine plus six plus two) equaled 17.

Then Al-Khwarizmi asked,

"Now, can I have my camel back?"

These young men had information about prime numbers, but they lacked the wisdom to use the information effectively. It is the manipulation of information to accomplish seemingly impossible purposes that defines true wisdom.

Today, we have ten billion pages of information posted on the Internet—more than enough to keep us busy the rest of our lives, and new information is being added daily. More information has been created in the last 100 years than in all of the previous 100,000 years combined. We need the wisdom to sift through and convert these billions of pages into information riches.

The genius of Al-Khwarizmi was not in his mathematical wizardry or even his book Knowledge: It was in his experiential knowledge—his big-picture, right-brain thinking, creativity, innovation, and wisdom. It was his wisdom to add a camel to make the total 18 and still get his camel back.

Prime numbers are to whole numbers what the laws of physics are to physics.

Twenty years ago, I used an Al-Khwarizmi approach to solve a notoriously difficult problem in computational and mathematical physics. I added inertial force, which enabled me to reformulate the 330-year-old Newton's Second Law of motion first as 18 equations and algorithms, and then as 24 million algebraic equations.

Finally, I programmed 65,536 "electronic brains" called processors (or sub-computers) to work as one to solve those 24 million equations at a speed of 3.1 billion calculations per second.

Like Al-Khwarizmi, I derived my 18 equations through out-of-the-box thinking in an in-the-box world, adding my metaphorical camel: inertial force. In other words, I applied wisdom to Known Knowledge to generate intellectual capital.

Unless Africa significantly increases its intellectual capital, the continent will remain irrelevant in the 21st century and even beyond.

Africa needs innovators, producers of knowledge, and wise men and women who can discover, propose, and then implement progressive ideas.

Africa's fate lies in the hands of Africans and the solution to poverty must come from its people.

The future that lies ahead of Africa is for Africa to create, after the people have outlined their vision.

We owe it to our children to build a firm foundation to enable them go places we only dreamt.

For Africa to take center stage in today's economic world, we have to go out and compete on a global basis.

There is simply no other way to succeed.

Philip Emeagwali
The Fairmont Hotel Macdonald
Edmonton, Alberta, Canada.



Part 3

A Father of the Internet
University of Alberta
Edmonton, Alberta, Canada.
September 23, 2006
PHILIP EMEAGWALI

I was asked:

"Why are you called 'A Father of the Internet'?"

Any book on the history of the Internet will explain that the technology came from hundreds of fathers, as well as mothers, aunts, and uncles.

It was not born in a single place or time; it grew organically

incrementally, following trails that ^{and} intersected with little rhyme or reason.

In my trail, I theorized that 65,000 computers enshrouding the Earth as an electronic clothe could forecast the weather.

That theorized supercomputer, is an internet, defined and outlined by 65,000



Computers.

The book "History of the Internet" described my computations and communications using 65,000 sub-computers connected as a hypercubic internet. It also described my theorized "hyperballs," as an internet defined and outlined by 65,000 computers, which would be the size of the Earth.

I began by theorizing how to connect 65,000 computers around the Earth, as an internet that is a supercomputer, and vice-versa.

I lifted my supercomputer to an internet that used 65,000 sub-computers to compute and communicate any number in sight and turn my story into history.

The big idea was that I could use my knowledge of deeply nested networks as a metaphor for plants, animals, and other living entities who, through their interactions, were continuously creating their own hyperball around the Earth.

I was also trying to look into the distant future—an exercise that is like ~~trying~~ setting our brains on fire. New knowledge is often counterintuitive and likely to be rejected, at least at first.

It is a mystical, poetic experience to stand on the outer limits of knowledge, on a place that has no beginning and no end.

We know that in four-dimensional time and space, our collective lives form an unbroken chain that began three and a half billion years ago as an embodied consciousness that continuously converted matter and energy into organic material.

As such, our existence is greater than the sum of the parts. Such an idea adds a whole new dimension to sustainable development.

Hopefully, this conversion and growth will extend to the death of our sun, or perhaps even beyond.

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Technology Widens Rich-Poor Gap
Diaspora Showcase Africa
Tucson, Arizona
September 29, 2007

Oil has made us billions and fuelled our economic stability, but oil has also become the bane of our existence. For some, it is a curse that has caused poverty and corruption, but for others it is an essential source of untold wealth and power. But as the gap between rich and poor countries continues to expand, it is clear that intellectual capital and technology rule the world, and that natural resources such as oil, gold, and diamonds are no longer the primary determinants of wealth.

Surprisingly, nations with few natural resources demonstrate greater economic rates than OPEC countries. Japan's economic growth, driven by technological superiority, outpaces that of Saudi Arabia; South Korea is growing faster than oil-rich Nigeria; and Taiwan's economy has moved well beyond that of oil-rich Venezuela.

The United States and Norway are also rich in oil, yet their staggering economic growth comes from intellectual capital.

In reality, it is not money but intellectual capital that drives prosperity. More important, perhaps, is the reality that poverty is driven and sustained by a lack of intellectual capital. The intimate relationship between intellectual capital and economic growth is as old as humanity itself, and is well illustrated by this parable from ancient Babylon (modern-day Iraq).

A man asked his children:

"If you had a choice between the clay of wisdom or a bag of gold, which would you choose?"

"The bag of gold, the bag of gold" the naïve children cried, not realizing that wisdom had the potential to earn them many more bags of gold in the future.

Seven thousand years later,
Iraq — the cradle of civilization —

has its own private bag of gold as it sits perched atop the world's third largest oil reserves. Meanwhile, Israel, tucked away in the hostile terrain of a barren desert, has the clay of wisdom — the weightless wealth of intellectual capital embodied in the collective mind of its people.

The striking economic gap that persists between rich and poor nations has increased sevenfold over the past century to what is now an all-time high. The accumulation of intellectual capital by rich nations has helped broaden this gap because it has enabled them to control technology and collect hidden taxes from less affluent nations. For instance, Nigeria pays a 40-percent "royalty" tax on its petroleum revenues to foreign oil companies that are ripping out its family jewels — the huge store of wealth in its oilfields. These oilfields started forming when prehistoric, dog-sized humans — our common ancestor with the apes — walked African grasslands on four legs.

It's a shocking reality, but the deep oil reserves laid down by Mother Nature millions of years ago and nurtured through the millennia in Africa have been whittled away within decades. And, for the dubious privilege of surrendering its natural resources forever, Nigeria is required to pay half its petroleum revenue in the form of "royalties" to the rich kids on the global block, the United States and the Netherlands. That oilfield has been exchanged for a bowl of porridge, and the black gold that should serve the underserved in Nigeria is helping wealthy Westerners get wealthier.

Today, half the world's population — three billion people — live on an average of \$500 a year. In contrast, Bill Gates earns \$500 every second. By controlling technology and taxing computer users, Gates has become wealthier than each of the 70 poorest nations on earth and using his financial might has conquered more territory than Genghis Khan, Julius Caesar and Alexander the Great combined.

While Bill Gates is the new millennium's Prince of Technology, he is by no means the first to have taken on the huge potential offered by the realm of technology. The Romans used roads and military technology to expand their empire. And, for centuries, Britain ruled a quarter of the Earth due to its unparalleled ability to command maritime technology and conquer the Seven Seas.

Britain undoubtedly established itself as the world's first superpower through its rapid and ruthless colonial expansion program. The British raised the Union Jack over Canada and Australia, India and Hong Kong, Egypt and Kenya, and countless other countries — even the United States. The Union Jack cast its shadow in every global time zone, giving rise to the saying, "The sun never sets on the British Empire," a fact that was cold comfort to the colonized nations.

In the same way, the United States has embraced its technological supremacy.

both offensively and defensively, to build its own global empire without a physical presence in any of its "colonies." The sole remaining Superpower is at the forefront of every major technological advancement, which it has used to become deeply embedded in three-quarters of the globe. The US has accomplished a virtual economic colonization manifesting its presence throughout the globe by harnessing the power of technology and capitalizing on its clzy of wisdom.

Africa's inability to realize its potential and embrace technology has left it at the mercy of the West. The time has come for Africa to seize the day and resist the efforts of America and others to leave their imprint and plunder its natural resources.

Numerous examples throughout history support the idea that technology can be used as a tool of oppression. And there's little doubt that America's technological advancement has allowed it to exploit natural resources around the world. This is particularly evident

in Africa, where the US is exploiting oilfields beneath the pristine rainforest and being rewarded with a 40-percent tax at the expense of the African people. This lends credence to history's assertion that those who control technology oppress those who do not, eventually enslaving them and, finally, wielding power around the globe

Debates on Slave Trade Overlook the
Role of Technology
Diaspora Showcase Africa
Tucson, Arizona
September 29, 2007

According to history books, gun-wielding European slave traders kidnapped one in five Africans and transported them across the oceans. A less visible, but no means drastic technological tool of suppression, is the compass, a device used worldwide for navigation. In the same way that Britain used its maritime knowledge and the US harnessed its intellectual capital to rule the world, the early slave traders used the simple compass to wreak havoc on civilization. It is a sad fact that the innocuous navigation tool originated during and was fuelled by the Atlantic slave trade. The technological development of the innocent compass, invented in China for religious divination 2,000 years ago, allowed Africa to be ravaged in unspeakable ways.

It was the compass that created the Atlantic

slave trade, enabling the early colonial navigators — and their blood merchants — to chart an accurate course from Gorée Island, off the coast of Senegal, to Brazil; paving the way for the trans-Atlantic slave trade, which began on August 8, 1444. This trade in human merchandise covered four continents and lasted four centuries, and serves as a shameful beacon for the depravity of human greed and conquest.

The compass became the *de facto* weapon of mass destruction, which led to the de-capitalization and decapitation of Africa. It created the African Diaspora with one in five people taken out of the motherland. It was the largest and most brutal displacement of human beings in human history -

Today, it is hard to imagine that such destruction and the wholesale abduction of a race could result from a tool as common as the compass. Yet, as a people who survived the slave trade, we must draw our strength from lessons learned from the past and

draw our energy from the power of the future. And the power of the lies in "controlling" technology and harnessing it for the benefit of mankind, not for his destruction.

The people of Africa must take note that the Internet is our modern-day compass, and within it resides our own clay of wisdom. As we prepare ~~for~~ for our great journey into the cyberspace of the future, with its technological promise — its clay of wisdom — we must understand the strategic value and potential of this all-important tool. Our image of the future inspires the present and the present serves to create the future.

Africa's Lack of substantial technological knowledge of the Internet and its potential may lead it to be assaulted or manipulated in unexpected ways, just as it was devastated generations ago for the lack of a simple compass. We didn't recognize the power of the compass then; the danger is that we don't recognize the power of technology today. While Africa merely contemplates the

future, the West, the quickest off the mark to wield technology's weapons, actually makes the future.

This fact, and how the power of technology can be wielded against the poor, was brought home to me clearly when I received the following email recently:

"About a year ago, I hired a developer in Africa to do my job. I am paying him \$12,000 a year to do my job, for which I am paid \$67,000 a year," the sender wrote.

"He's happy to have the work and I'm happy that I have to work only 90 minutes a day. Now I'm considering getting a second job and doing the same thing."

Technology in the hands of others has been used to exploit Africa for centuries. But now it's time for Africa to grasp technology and finally embrace the modern age's clay of wisdom and advancement. Africa has the chance to show the

world how technology can be used for good, not evil. And the people of Africa can use today's technology, not to mimic their own exploitation, but to right the wrongs of the past and empower themselves with the same tool that has been used to oppress them in the past. Africa can provide a shining example for the world in using technology for its own upliftment and the benefit of mankind.

This time, it is our choice.

Philip Emeagwali

Dance of Death

Asaba, Nigeria

October 5, 6, & 7, 1967

PHILIP EMEAGWALI

Walk with me down memory Lane.
The time: 1968. In 30 months, one million dead. The setting: a dusty camp in Biafra where survivors waited and hoped for peace. The survivors: Refugees fleeing from the "Dance of Death." My mentor: One of the refugee camp directors, whom I called "Teacher" out of respect.

"Martin Luther King has been killed," Teacher said, with a pained voice and vacant eyes. I looked towards Teacher, wondering: "Who is Martin Luther King?" I was a 13-year-old refugee in the west African nation of Nigeria, a land then called Biafra. Martin Luther King. What did that name mean?

Eight out of ten Biafrans were refugees exiled from their own country. Two years earlier, Christian army officers had staged a bloody coup killing

Muslim Leaders

The Muslims felt the coup was a tribal mutiny of Christian Igbos against their beloved leaders. The aggrieved Muslims went on a killing rampage, chanting: "Igbos, Igbos, Igbos, you are no longer part of Nigeria!" In the days that followed, 50,000 Igbos were killed in street uprisings.

Killing was not new to us in Biafra. I was 13, but I knew much of killing. Widows and orphans were most of the refugees in our camp. They had survived the Igbo "Dance of Death"—a euphemism for the mass executions. One thousand men at gunpoint forced to dance a public dance. Seven hundred were then shot and buried en masse in shallow graves. When told to hurry up and return to his regular duty, one of the murderers said: "The graves are not yet full."

A few days later, with only the clothes on our backs, we fled from this

"Dance of Death." That was six months before Martin Luther King Jr. was assassinated. Teacher and I were eventually conscripted into the Biafran army and sent to the front, two years after our escape.

After the war, Teacher—who had taught me the name of Martin Luther King—was among the one million who had died. I—a child soldier—was one of the fifteen million who survived.

Africa is committing suicide: a two-decade war in Sudan, genocidal killings in Rwanda, scorched-earth conflicts in Ethiopia, Somalia, Uganda, and Liberia. The wars in modern Africa are the largest global-scale loss of life since the establishment of the Atlantic slave trade, which uprooted and scattered Africa's sons and daughters across the United States, Jamaica, and Brazil.

Africa's wars are steering the continent toward a sea of self-destruction so deep

that even the greatest horror writers are unable to fathom its depths.

So, given our circumstances, Martin Luther King was a name unknown, a dead man among millions, with a message that never reached the shores of Biafra.

Neither did his message reach the ears of "The Black Scorpion," Benjamin Adekunle, a tough Nigerian army commander, whose credo of ethnic cleansing knew nothing of Martin Luther King Jr.'s movement: "We shoot at everything that moves, and when our forces move into Igbo territory, we even shoot things that do not move."

As we heed Martin Luther King Jr.'s call, and march together across the world stage, let us never forget that we who have witnessed and survived the injustice of such nonsensical wars are the torchbearers of his legacy of peace for our world, our nation, and our children. — Philip Emeagwali
April 4, 2008. Morehouse College, Atlanta, GA.
40th anniversary of Martin Luther King's assassination.

Africa Must Produce or Perish
Valencia, Spain
May 11, 2008
PHILIP EMEAGWALI

Imagine that it is May 25, 2063, the 100th anniversary of Africa Day, a day for reflecting on Africa's successes and failures. The newspaper headline announces, "Last Remaining Oilfield in West Africa's American Territory Dries Up."

The article continues: "The Last patch of rainforest will soon be empty land scarred by oil pipelines, pumping stations, and natural gas refineries. Wholesale pollution will be the environmental legacy for future generations."

"Africa's offshore oil reserves will ebb away. Abandoned oil wells could well become tourist attractions, and oil-boom settlements will be transformed into derelict ghost towns."

"In a world without oil, air travel will disappear, and people will voyage overseas on coal-powered ships. Farmers will use horses instead of tractors, and scythes instead of combine harvesters. As crops diminish and populations soar, famine will grip the globe. With no means to power their vehicles, parents will be housebound, without jobs, and children will walk to school."

This scenario could become a reality, because we no longer have an abundant oil supply. We know oil exists in limited quantities and that most oil wells dry up after 40 years. It is as certain as death and taxes. Rather than debate the exact year when we will run out of oil, I prefer to imagine that we have already run out. It may come sooner than any of us expect.

Our heirs will thank or curse us for how much oil we left for them. Instead of asking, "When will Africa run ~~out~~ out of natural resources?" we should ask, "When will Africa be unable to

export raw materials, either for lack of our own oil or because foreign markets have themselves dried up?"

A \$100 bar of raw iron is worth \$200 when forged into drinking cups in Africa,
\$65,000 when forged into needles in Asia,
\$5 million when forged into watch springs in Europe.

How can this be? European intellectual capital—the collective knowledge of its people—allows a \$100 raw iron bar to command a 50,000-fold increase! It could be said, therefore, that a lack of intellectual capital is the root cause of poverty.

Without African intellectual capital, iron excavated in Africa will continue to be manufactured in Europe and exported back to Africa at enormous cost. To alleviate poverty, Africa needs to cultivate creative and intellectual abilities that will allow it to increase

the value of its raw materials and to break the continent's vicious cycle of poverty. Poverty is not an absence of money. Rather, it results from an absence of knowledge.

In oil-exporting African nations, multinationals such as Shell (selling rigs for a 40% royalty on exported oil) are getting rich, while the oil rig workers remain poor. Instead of addressing the underlying causes of poverty—minimal productivity resulting from a lack of intellectual capital—Third World Leaders have focused on giving false hope to their people.

We need less talk about poverty and more action to eliminate it. So how do we do this? Education has done more to reduce poverty than all the oil companies in the world. So it is disheartening to realize that few leaders believe that their people's potential is far more valuable than what lies beneath the soil.

Intellectual capital, not higher wages, will eliminate poverty in Africa. If we all demand higher wages, we will end up paying the higher wages to ourselves. Intellectual capital will result in the creation of new products derived from new technologies. The end result will be not just a redistribution of wealth, but the creation and control of new wealth.

And Africa's power to reduce poverty will open the floodgates of prosperity for millions of people. One catalyst for such prosperity could be telecommuting. ~~*~~ If 300 million Africans could work for companies located in the West (just as millions of Indians do), then both regions would benefit. The strategy would be to recognize the labor needs of the global marketplace, and enable Africa to fulfill those needs.

For example, tax preparation experts living in Africa, where labor is cheaper, could fulfill the needs of US-based accountants. Furthermore, the time difference could allow for a fast turnaround in service. It is

clear that Knowledge and technology is crucial to alleviate Africa's poverty.

Africa will perish if it continues to consume what it does not produce, and produce what it does not consume. The result will be a depressing cycle of increasing consumption, decreasing production, and increasing poverty. We are missing a golden opportunity by not using the trillion dollars earned by exporting natural resources to break Africa's cycle of poverty.

We are at a crossroads where one signpost reads "Produce" and another reads "Perish." We risk becoming like the driver who stops at an intersection and asks a pedestrian, "Where does this road lead?"

And the pedestrian replies, "Where do you want to go?"
"I don't know," the driver replies.

"Then it obviously doesn't matter which road you take!" replies the

pedestrian.

If we adopt the same attitude as the driver, Africa will have lost its chance to "choose" its future.

For decades, power in post-colonial Africa rested in the hands of those with guns, not those with brains. We were not always at war with our neighbors, but we were always at war with poverty. And we spent more on guns than on books and bread.

Africa's choice is clear: produce or perish. However, it is important that we do not blindly choose the lesser of two evils — producing what we cannot consume or consuming what we cannot produce. We can avoid this. My wish is that by the end of the 21st century high-end products in New York City will sport the label: "Made in Africa."

We cannot look forward to our future until we learn from our past. Five thousand years of recorded history reveal

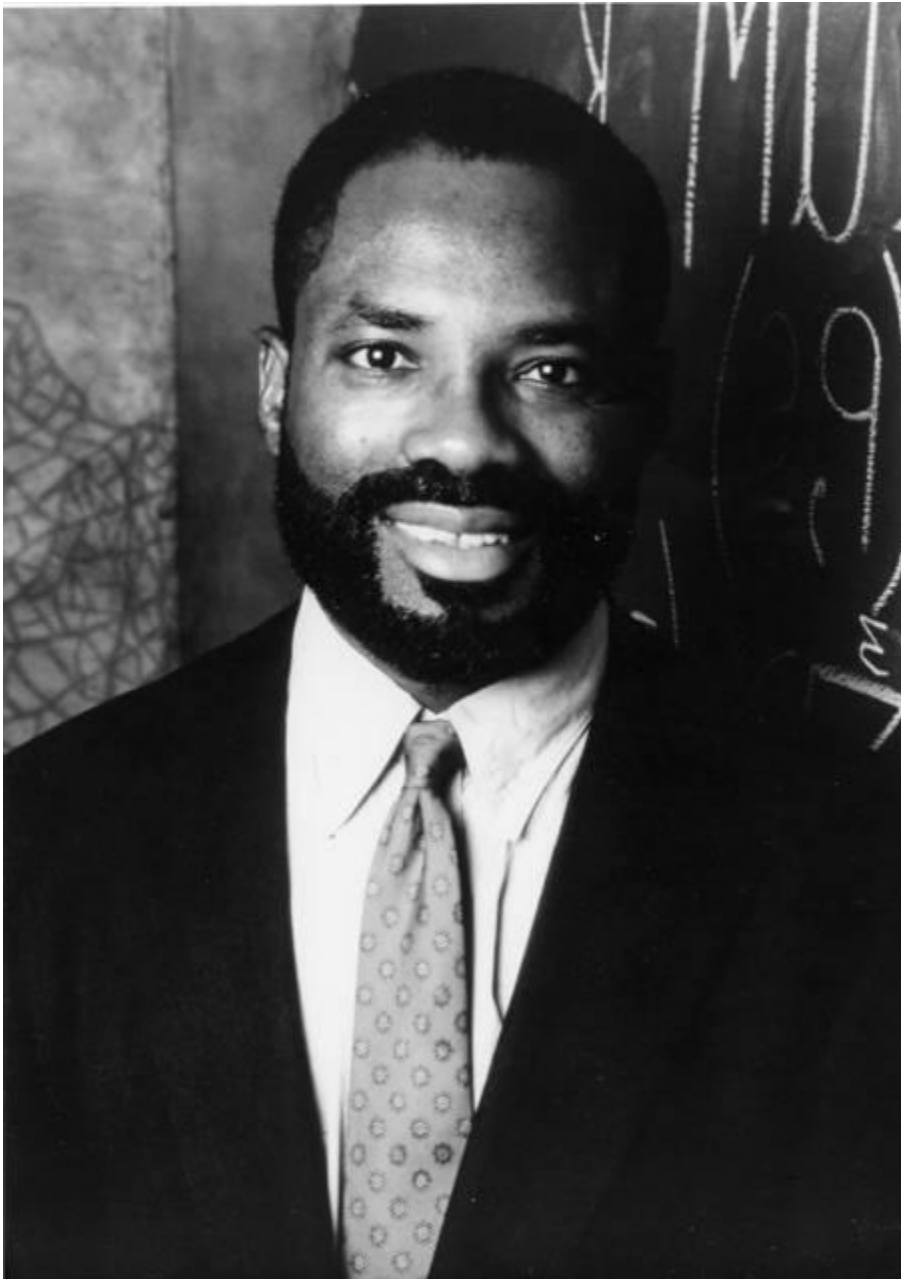
that technology was ancient Africa's gift to the modern world. Forty and a half centuries ago, geometers in Africa's Nile Valley region designed the Great Pyramid of Giza, the last of the Seven Wonders of the Ancient World. That man-made mountain remains the largest stone building on Earth. It is an icon of engineering and testifies that Africa was once the world's most technologically advanced region.

It is absolutely imperative that Africa regain its technological prominence, which will enable it to produce what the world can consume. When we do that, Africa will finally be eating the fruits of its own labor. When Africa has regained its technological prominence, the world's leaders will seek it out. And, like a rainforest renewed, Africa will flourish again.

Philip Emeagwali
Africa Day 2008
Palacio de Congresos
Valencia, Spain

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