



My Quest for an Internet

In this, the 16th installment of our weekly series at emeagwali.com, we review Philip Emeagwali's hypothesis that scientific discovery and technological innovation must precede poverty alleviation in Africa.

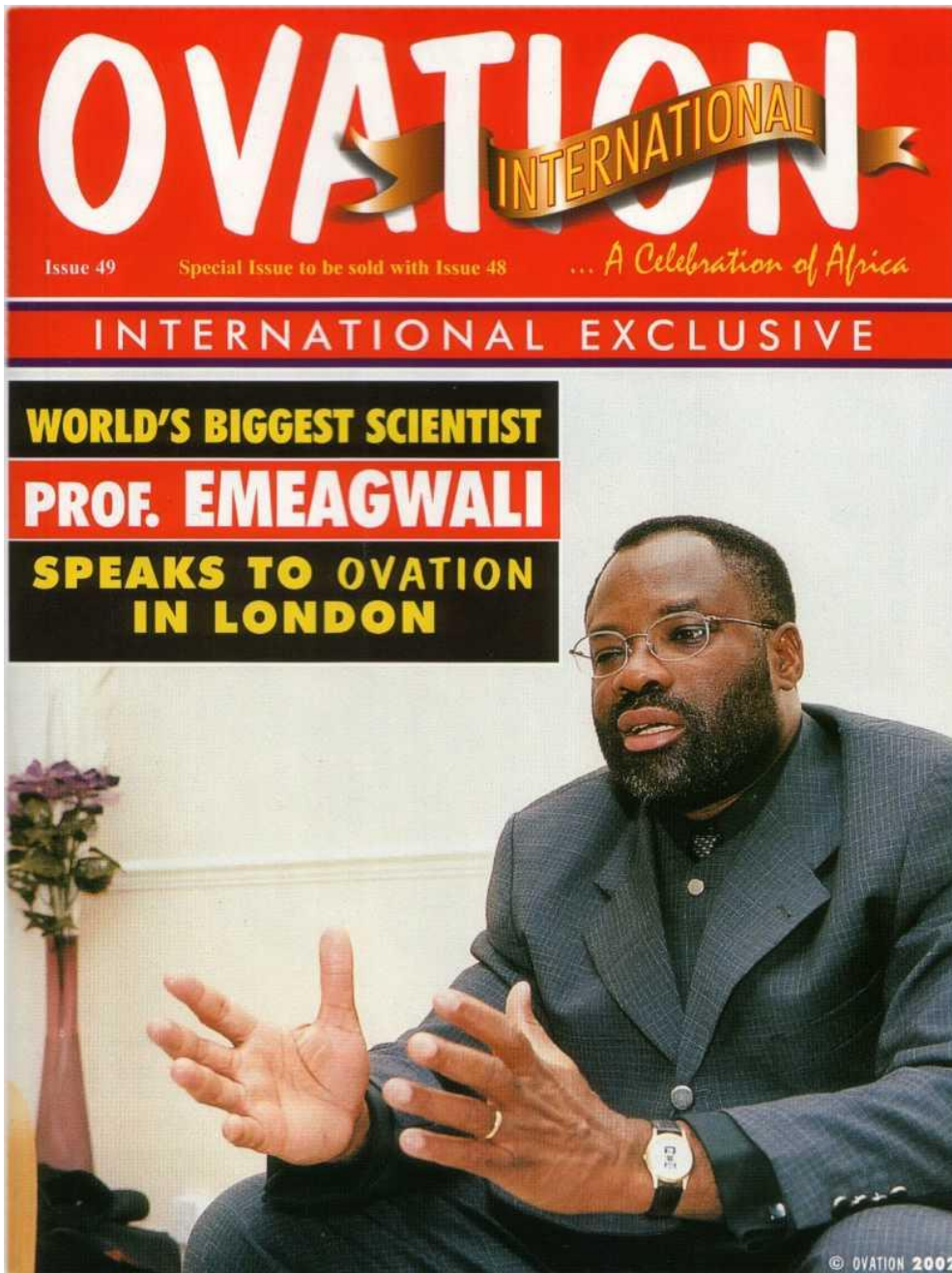
Africa Must Innovate or Perish

Transcribed and edited from a lecture delivered by [Philip Emeagwali](http://emeagwali.com). The unedited [video](http://emeagwali.com) is posted at emeagwali.com and <http://www.youtube.com/watch?v=mxU-izhbEWI>

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.

A nation that is
second to none in
science is second
to none in
economic power.

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 the globalized world of the twenty-second century, there will be more Africans outside Africa than inside.

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.**

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.

was front page news.

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

Developing a better technology also Europeanizes the African identity through globalization.

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."

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 is 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](#)

Shall we go without echo?

Sir,

My name is Vincent Chukwuma Ekpokoba, I have been in Poland and later in Germany since 1979.

I have a diploma in computer technology and Msc in electrical engineering. I have presently a one man undertaking "Byteron Networks" Repairs, sales and services of Pcs and electrical and electronics equipments. I studied Psychology with specialisation on Human psychology and society mind programming. What made me to want to contact you Sir is your statement. NO QUOTE: Africa will either buckle up or perish. That is what I have been telling some of our so called intellectuals but they seem to think that in the new order there will be a space for a race that do not contribute personally TO THE SAYINGS IN THIS WORLD.

Almost the most important riches in the world is located in Africa. Nigeria URAN is the purest, Nigeria petroleum is the purest (BONEY SPECIAL). Sir Do you know that people like us (I mean people who can read beyond the clear material words) are only a disturbance to the western world. " You know too much". I beleive that the mind of future Africans has to be reprogrammed(not brain washing). We have the best climate, the greens the others are trying to protect is in abundant in our places, we are born in a healthier world even if we live dirty. our skin, our way of self esteem is healthier But ignorancy and lack of ability to read the world beyond our color is a handicap to all Africans. Even in some Black species we tend to differentiate.

Please Sir, I am not bothering you for nothing. I am not a writer so if what I am saying is not important to you simply do not reply. I think I have the duty of leaving part of me behind for my race. not children to inherit degradation but self awareness.

I am trying to form a forum ACAG(African cultural awareness groupe: for anybody who is interested in the original African culture that shape the the behavioralism of a black African and its untapped value to mankind). We must check what we poces (quality and hinderance) before we decide what to import to our culture. Today we import many things(not material things from anywhere just because they allow us to be different among our people because we hail a foreign devil and feel a disgust to indigenous angels). Ofcourse Sir, You will hear much from me if I will not die before carrying out my task. If you can make out time to listen to me personally, I would be very gratefull. I am tired of staying abroad. I came to Poland on Fedreal government scholarship and later my University education was funded partly by My cousin The late Dr Chuba Okadigbo and partly by Polish educational board. I speak and write Ibo language, polish language Engilsh language, German language. I understand standard Yoruba, Partly Russia standard and many other slovanian oriented languages (I do not speak). Thanks to God I am open to all new knowledges and I learn quick (mind programming).

I do not want to become a "Once Upon A time".

I should hope that you will understand me.

Thanks with all due respect

enr Vincent Chukwuma Ekpokoba

PS remember that if anybody decide one day to poison the whole Africans, nobody will stop him....nothing is controled.

The whole citizens has no awareness of this fact. The undiscoverd wealth is too much in African villages. In Nigeria for example a foreign company will buy a land full with lime stone and other wealthy deposits for a price of peanuts (the land ofcourse is not good for farming and that makes it useless to the owner who is ignorant of the real deposit). Such lands are supposed to go for leasing and not sale.

If this is not of interest to you Sir then I will seek further for other philanthropist. What I poces is for me to make impact on this world for my people and mankind.

I need only a physical assistance " A tree cannot make a forest and we have many trees like you Sir but still they are so scatterd that they still do not build our forest.

Please Sir, can we not build Up an African accademy of thinkers. not money seekers(If you build that up, they will control our society with mordern mind setup) A PROUD MORDERN AFRICAN. Will Africa be always associated with crime hunger, dirtiness and all negetivity. My people have no reason to be jobless or hungary. We have a man made hardship in Africa(Nigeria Ibo). Although we do not know it but we are law abiding citizens only that we lack control.

I visited the new Ibo Built tradefair and everything there funtions: they have there rules and regulations and even the most arrogant of them keep these rules. As the Ibos know all the tricks so they make rules to track all the tricks. That baffles me that if really the Ibos are allowed to rule the country enmass. no one will ever dream of tricking any one in that country called Nigeria. I think these group of people are a blessing to Nigeria as a nation only no one has ever thought of this "this way".

Sir If ever your employees will allow you see this (I pray). If you will remember this in your last day in this world I pray it will be your best decision. It will not bring you cash income but a name that rings bell greater than what you already have(I presume).

Sir, Incase you decide not to have any contact with my message please destroy anything connected to this and any sign that I have ever contacted you.

Thanks

Vincent

--- On Wed, 3/9/11, Philip Emeagwali <philip@emeagwali.com> wrote:

- > From: Philip Emeagwali <philip@emeagwali.com>
- > Subject: Re: Our Position? Shall we go without echo?
- > To: "Vincent Ekpokoba" <ekpokoba@yahoo.com>
- > Date: Wednesday, March 9, 2011, 3:47 PM
- > Vincent:
- >
- > In 1968/69, Mr. Okadigbo (senior) spent his evenings at my
- > father's
- > verandah. His came to discuss the progress made by Biafran
- > army in
- > recapturing Onitsha. In the summer of 1978, his son,
- > George, will pick
- > me as well as my girl friend (now wife) to play tennis in

- > Druid Hill
- > Park, Baltimore.
- >
- > I might visit and speak in Croatia, Warsaw and Prague in
- > the next three
- > years.
- >
- > Can I share your letter with my website visitors?
- >
- > Regards,
- > Emeagwali
- >

Sir,

Thanks for giving a hearing and replying my letter despite your tight schedule I surpose.

Ofcourse you are very free to use my letters in any way you wish.

I will be very gratefull if I am informed when you will be visiting EastEurope especially Poland(Warsaw). I would be happy to be present.

I know that you are aware that Okadigbo Senior(Mr Pius Okadigbo) passed away in the year 1974. There had been a lot of tragedies in the family since then including the sudden death of Chuba. We do not have much of our elites left but nevertheless we live for us and others. It's really not about how long one lives but what effect is left behind.

I am looking forward to hear from you Sir. I thanks once more for your time.

With all due respect

Vincent Chukwuma Ekpokoba

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 les égaux 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 appliquées, 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

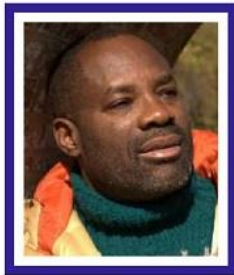
C'est à nous de construire l'avenir.
Mais d'abord, nous devons exposer les grandes lignes de notre vision.

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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