

17th Annual B.O. Osuntokun Lecture

**AFRICA, CLINICAL SCIENCE
AND ORIGINALITY
The Wages of Disconnect**

by

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The Benjamin Oluwakayode Osuntokun Trust, Ibadan

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Today it has fallen to my lot to be the *prima donna* at the annual 6th of January event, commemorating the birthday of a dear and trusted friend and colleague, Professor Benjamin Oluwakayode Osuntokun (simply known to me as Kayode), who was called to eternity in 1995. In the maiden ember month of this New Year it will be twenty years that he left us, but his memory remains evergreen.

Many in the audience will be surprised to learn that I did not know Kayode well until the early 60s. His elder brother Edward was a few years my senior at the College in Apataganga and by the time I left the University College to commence my clinical studies in London, Kayode was probably just coming into UCI. But his fame had preceded him, for I had heard, even when I was in London, about the outstanding scholars that were adorning the new medical school at Ibadan, and he was certainly one of them. I had also heard the story of his having thrilled his external examiner in the O&G finals by sketching at a *viva-voce* the configuration of a complex estrogenic hormone unknown to many of his teachers. His powers of recall were known to be legendary and he would render chapter and verse of any event or clinical history and findings in exasperating detail. The prodigy, latent in his reading the Bible from cover to cover at the age of six, beats the imagination, but I suspect his deep understanding of the Holy Book was to follow much later and may not at that time have attracted the response to his elders' question "where is Kayode?"

I am sure he would in those tender years not have retorted, like our Good Lord:

“Wist ye not that I must go about my father’s business?”

There was a remarkable deluge of touching tributes at his passing in 1995, but the common thread that ran through those eulogies was that of an agile and enquiring mind always searching and researching. His fertile intellect was always seeking to know “how?” and “why?” and the directors general of the WHO and the UNESCO at the time of his demise commented eloquently on his tremendous mental acumen and monumental contribution to the work of these international organizations. Indeed, he was a member and later chair of the WHO’s Advisory Committee on Health Research (ACHR) and a much-valued collaborator in many of the international activities of the executive committee of the Council for International Organizations on Medical Sciences (CIOMS).

One could go on and on about a man who in his time was a prominent player on the world stage of clinical science and who touched nothing that he did not adorn.

In searching for a title for today’s presentation I wrestled with many options:

- Engaging a Double Future – Science & Service**
- Originality – The Next Level for African Scientific Effort**
- Keeping Pace – An African Perspective, with Lessons from other Cultures**

Tying up Loose Ends in Clinical Science. How Soon is Now for Africa?

Clinical Science in Africa – Of Know-How and Do-How

Engagement or Estrangement: The Crisis in Africa's Clinical Science

Clinical Science, Unfinished Business & Other Matters

You will notice in all these seven candidate-titles that a flavour of despondency bordering on despair is manifest—that our continent has been left far behind in contributing fundamentally to human knowledge.

Originality, or the lack of it, has always been beckoning as an area worthy of engagement, but we must admit that Africa remains, even till today, the *bête noire* of global scientific progress. Practically all the preceding annual lectures in this memorial exercise relate the Osuntokun legacy to challenges in research—epidemiologic, biomedical, clinical, environmental, translational, cross-cultural and even philosophical. I thought that for this important milestone it would be valuable to explore the premises of originality in clinical scientific research in order to demonstrate the enormity of the task before our continent.

Any meaningful discourse on the true understanding of *originality* must have as its departure point the history of mankind—how things came to be what they are, and how the gift of scientific wisdom can help shape our understanding of our

environment. Even when *Democritus* proposed the Atom (*atomon* means indivisible in Greek), the scientific method of observation and deduction was still primitive. Euclid and Archimedes were the true fore-runners in original thinking. Philosophers soon began to ask certain questions:

When did time begin?

What is the nature and extent of the universe?

How vast is space?

How was the earth formed?

Free thinkers were thereafter intimidated by the church, for these kinds of questions threatened spiritual “faith”. The church was comfortable with things as they were and did little to understand and even less to challenge the purpose of the creator of mind and matter. Science eventually triumphed because it was based on a laborious process of trial and error, the testing, revising, challenging and discarding of hypotheses, the diligent construction of theories that fit known facts, and the modification or abandonment of these as and when new facts emerge. All these, in short, have gone on to vindicate and strengthen the scientific enterprise and validate the virtues of *originality*.

The following list enumerates some legendary original thinkers and researchers, each having contributed ideas that moved their generation forward into consciousness of the dividends of originality:

- | | |
|-------------------|--------------------------|
| Ptolemy | - Mathematics |
| Al-Kwarizmi | - Numerals |
| Leonardo da Vinci | - Painting, Architecture |
| Copernicus | - Astronomy |

Galileo	- Pendulum Clocks, Thermometer, Telescope
Linnaeus	- Botany
Lavoisier	- Chemistry – the elements
Faraday	- Electricity
Darwin	- Evolution

In my own field of medicine:

Hippocrates	- Clinical observations
Vesalius	- Anatomy
William Harvey	- Circulation of the Blood
Pasteur	- Microbes
Mendel	- Heredity
Madam Curie	- Polonium & Radium
Paulin	- Protein
Fleming	- Penicillin
Watson & Crick	- The Double Helix

The pride of place in original thinking must, however, go to Isaac Newton who, through observing the “apple fall” propounded the laws of gravity. His genius went beyond that feat to develop the science of calculus and unlock the secrets of coloured light. The poet Alexander Pope described him in the poignant verse:

*Nature and Nature’s Laws lay hid in the night,
God said “Let Newton be” and all was light.*

When Albert Einstein described his epochal Theory of Relativity in 1905, its implications were so profound as to overturn classical physics and transform established scientific thinking with regard to space, time, matter, energy and light.

The Swede, Alfred Nobel, who made his remarkable fortune from the business of gunpowder and allied explosives, toward the end of the 19th century established a foundation that was overly given to head-hunting for outstanding talent in various fields of intellectual endeavour—physiology/medicine, physics and chemistry, later economics, literature and ironically even later peace. His prize has now become the global benchmark for ultimate intellectual excellence in these defined fields. I will later on in this exposé discuss the Nobel initiative in some more detail, but permit me at this stage to examine talent in its true connotation.

All scholars build on an existing infrastructure of knowledge but an observation that makes a quantum leap in our understanding of phenomena and consequently facilitates its application to structure and function and in the orderly prosecution of our daily lives and living, is to me as close as we can get to *originality*, short of the biblical injunction of “let there be light”.

In tertiary institutions the world over, PhD awards are given on the basis of the candidate’s contribution to knowledge, but many of these are far from being earth-shaking. It is humbling to note that the famous Albert Einstein was reputed to have had his PhD thesis referred, and that even Newton admitted that the reason he was able to see very far was because he stood on the shoulders of giants. We often forget, however, that most of the major advances in the world around us were triggered by simple

observations, epitomizing Pasteur's aphorism that: *Dans le champs de l'observation la chance ne favorise que l'intelligence prepare'*

Genius, intuition, serendipity all have their historical antecedents but occasionally all three are combined in those destined to make a major breakthrough. Witness Alexander Fleming who noticed the inhibition of growth of bacteria on an agar plate kept on a windowsill and concluded that bacterial organisms must have been wiped out by an unknown agent – the *Penicillium notatum*. It was then left to Florey and his colleagues in Oxford to determine the structure and clinical efficacy of penicillin.

I had cause a few months ago to look into why certain countries have had more Nobel Awards than others. The United States of America led the pack from the beginning, and still does so. An analysis of these awards since 1907 reveals some interesting observations:

In the 107 years between 1905 and 2012, the United States has had 221 awards in three subject areas of physiology/medicine, physics and chemistry. This comes to approximately two awards per year. And if the 76 years in which US citizens actually received these awards are related to the total number of awards, it comes to three awards per year. This has not taken into account America's apparent dominance in the area of economics.

Among the Ivy League universities, less than twenty of them, share over 100 awards; the first eight of these institutions being:

1 In the field of observation chance favours the mind which is prepared.

Harvard, Cal. Tech. MIT, Stanford, Columbia, Princeton, Berkeley and Cornell.

Forty-four other universities and specialised institutes in the U.S. each had between one and four Nobel awards during this period, meaning that the geographic spread is wide within the nation and the level of scholarship and quality of research is practically uniform.

Many of these awards have been given to scientists whose contribution was based on team-work and inter-disciplinarity.

Many of the awardees from the United States emigrated from other nations—Europe, Middle East, Asia and the Far East and are now permanently resident in North America.

The ages of the awardees vary considerably and the gap between their original observations and eventual recognition ranges between two and twenty years. The cases of *Joshua Lederberg*, *Baruch Blumberg* and *Joseph Murray* all of whom I happen to have known personally.

It is sobering for Africa that in all these years only an handful of Nobel awards for scholarship have been recorded from Africa and these have been from south of the Sahara-- in medicine (3), chemistry (1) literature (4) Of these eight, six are from South Africa, one from Nigeria and one Zimbabwe. Practically all of these from South Africa are resident outside that country today and from the medicals a good deal of their research is carried out in laboratories outside the continent. Nobel Peace Prizes have a substantial number from the continent for understandable reasons—these include Mandela, Luthuli, de Klerk, Annan, and Tutu, Wangari Maathai, and Ellen Johnson Sirleaf . It is within the realms of conjecture that if some of our brightest and best had

emigrated to “God’s Own Country” as some Indians and Japanese did, they may today have been the proud recipients of such a unique global honour.

We can draw a salutary lesson from the efforts of Nigerian scientists on the West Coast of the U.S. who are currently working aggressively on a tropical medicinal plant extract shipped from our own shores here in Nigeria. Their project, which right now is shrouded in confidentiality derives from *Hypoestesrosea* – “The African Rose”. The so-called *natives* of West Africa have long used the leaves to combat skin rashes, fungal infections and abnormal growths (not then recognized as cancer!). This Immune Modulation Group holds several patents and plans to file the first three

Investigational New Drug (IND) applications with the US FDA for the use of **Hypoestoxide** against colon cancer, rheumatoid arthritis and malaria. It is also yielding encouraging results for managing CVD stents, COPD, acne, psoriasis and Alzheimer’s disease. It is relatively free of toxic effects and is remarkably polypotent.



Hypoestes rosea, African rose.

I might add that the *Hypoestes rosea* story has its historical antecedents in the likes of Dr James Africanus Horton, one of the first two West African Doctors of Nigerian descent. Horton (of Ibo parentage) and William Davies (of Yoruba lineage) were born in Sierra Leone by African liberated slaves. Both trained at Kings College London and subsequently went on to Edinburgh and St. Andrews universities for their MDs.



Dr. Africanus Horton

Horton, who was the more intellectually aggressive and vibrant, was commissioned into the West African Armed Forces as Assistant Surgeon-General where he made fundamental observations on the therapeutic properties of indigenous tropical medicinal plants.

Today 150 years later we can assert that all is not lost, as we reflect on the present escapades of our colleagues in California. This kind of research, as you can fathom, has great potential, but efforts to get the Nigerian private sector to invest in it have so far proved abortive. Ironically, it is the same private sector that will invest mightily in canvassing support for political parties or pay

millions of naira registering candidates for presidential or governorship primaries!

Nigeria is still basking in the shadow of a lone Nobel Prize in literature. How do we correct this gross anomaly? How do we improve on the quality of our intellectual capital?

Reflecting more deeply on this matter a few weeks ago I embarked on a search for the reason why Africa is so far behind in the pecking order. One could say, *mutatis mutandis*, that it is the same story with the present-day exercise of ranking of universities globally, and finding a similar dismal picture. The reasons are not far to seek:

Poor understanding of the place of research in national development.

Government's *laissez-faire* attitude to research & development.

Inadequate public recognition of intellect and scholarship.

Feeble private sector partnerships in funding research – too little too late.

Insufficient inter-disciplinary collaboration.

Individual scientific inexperience and the shortcut of preferring adopting to adapting; and adopting to challenging.

Playing down, by scholars themselves, particularly in the professional faculties, of the importance of scientific research qualifications and experience.

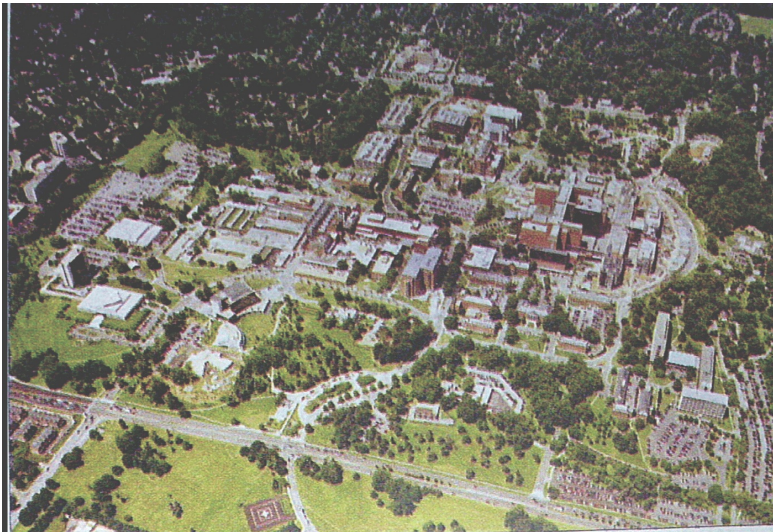
Almost in despair, I then further decided to examine the efforts of Nigeria's premier university–Ibadan–with its motto: “First and

Best” but whose position in the international pecking order of universities is less than glorious, to put it mildly. One must admit, however, that in the last decade or two Ibadan has made vigorous efforts to promote research and attract some funding from national and international sources. In spite of these, however, we remain a big fish in a small pond or in a less flattering phrase: “local champions”.

I have recently dared two adventures in attempting to understand our present predicament. First, I have tried to collate all PhDs given at the University of Ibadan in nearly 50 years. Collecting accurate data from Ibadan is a daunting task—this explains some gap years in my table. Numbers have risen from the single digits of the mid-60s to 614 in the 2014 Convocation. Ibadan’s post-graduate school is probably the largest in West Africa and the institution is now, with ample justification, orienting its purpose and redefining its mission to accommodate its new status and acquire its new *forte* as Nigeria’s hub of postgraduate studies.

Topping the list of PhDs in 2014 is the Faculty of Education with 142, followed by Arts (117), Agriculture (88), Science (74), and the Social Sciences (64). The professional faculties – within the College of Medicine, in Engineering and Technology, Pharmacy & Vet. Medicine have few PhDs, because professional fellowships are in a way quasi-academic and so many do not bother to supplicate for the MD or PhD. This is one of the major obstacles to the consummation of our research endeavours in the College of Medicine, where the number of faculties that have research qualifications cannot be more than a mere handful. It is as if the criteria for scholarship and the ability to undertake sustained research of international standard has been made to stand

on its head in the fashion of inverted academic snobbery. Any institution that adopts this myopic posture in intellectual pursuits must therefore be considered to be in praise of mediocrity. MDs encourage the sustained discipline of an enquiring mind and PhDs do this even more in any academic environment. Until our universities recognize the importance of this approach to academic work, we will continue to sell ourselves short and rate low in the pecking order of global tertiary institutions. The Basic Medical Sciences are by their nature more aware of this imperative than the Clinical Sciences, for a PhD becomes a *sine-qua-non* for their progress up the academic ladder.



THE NATIONAL INSTITUTES OF HEALTH, BETHESDA, USA
National Institutes of Health, Bethesda, Maryland, USA.

Resources for scientific research is another area of challenge on the African continent. The world of science is today dominated by the ruinous cost of original research and applied technology. It is

wishful thinking therefore to expect much progress from our continent unless the wherewithal is made available. Many successful businesses in Africa devote only a miniscule fraction of their after-tax profit to corporate social responsibility even when such support might conceivably boost the fortunes of their own organization. Some do not even have units of research and development (R&D). The more advanced societies place high premium on R&D, and even quasi-government institutions feature a sizeable budget. The National Institutes of Health in Bethesda, (USA) has an annual budget of over **30 billion dollars!** This is more than the annual budget of many African countries and certainly surpasses the combined research resources of all countries in sub-Saharan Africa. You can now see the futility of trying to compete with Western countries—there is certainly no level playground in this respect.

I will share with you the story of a colleague in the 60s who finished his DPhil programme around the same time that I did, He went on to an academic position in Birmingham (UK). Although he was fairly well endowed research-fund wise and attracted grants from Wellcome, Nuffield and other trust funds, he soon became restless and sought greener pastures across the Atlantic. At an interview in one of the Ivy-League universities in the United States he was offered a job that attracted over three times his U.K. salary and a research budget that was almost ten-fold his Birmingham budget. But then, at the interview he made an unusual request—he had a few scientists working with him in his laboratory and wanted the trustees (the appointment's board) to consider bringing them along to join him. He was asked to step aside so the trustees could deliberate on that possibility. Whereupon the decision was made to interview these candidates at a later date and have them

join the new appointee once they were found appointable. Five years later my colleague got the Nobel Prize.

There cannot be many countries in which this kind of opportunity would present itself and where such decisions can be so swiftly concluded.

Some months ago, as soon as I zeroed in on “originality” as a worthy topic to engage, I thought I might choose Ibadan as an example, mindful of its clinical and postgraduate pedigree. I sent a circular to all departments in the College of Medicine without fully revealing my purpose. The circular read thus:

02 June 2014

Heads of Departments

College of Medicine

University of Ibadan

CONTRIBUTIONS IN MEDICAL SCIENCE

This is an unusual request but I would like you to give it careful thought in order to respond appropriately. It has occurred to me over many years that with the enviable legacy of Medicine in Ibadan as one of the four foundation faculties of the University College in 1948 (comprising three of its first four foundation professors – Medicine, Surgery, and Public Health) the institution should by now have a great deal to showcase in academic medicine and its application at the local setting.

There probably are a few kilometres of articles in learned journals by Ibadan scholars over the past six decades but what we are looking for are ORIGINAL

CONTRIBUTIONS of departments to medical knowledge and their relevance to our health status and to health care promotion. Have we managed, through our research endeavours, to impact positively on the general health and well-being of the populace?

I would like to invite you to identify two or three areas in your department in which original research has had a palpable effect on the promotion of medical science. Scores of papers have been written standing on the shoulders of ideas generated by other cultures and scientific communities. However, Africa today enjoys the dubious distinction of merely confirming postulates, implementing and complementing the efforts of scientific societies outside our continent.

I state in the accompanying attachment a random sample of topics in which original research has moved us closer to the frontiers of medical scientific knowledge and its application. For our continent there are still many loose ends to tie up, but the phenomenal growth in human scientific capacity has not been matched by a commensurate increase in original think-through.

May I venture to challenge your department that surely you must have made some fundamental observations in these six decades?

I would thus be immensely grateful were you to highlight one or two areas (and perhaps even more!) in which your discipline has made such contributions. This information is needed urgently to escape the charge that

Ibadan (and indeed Africa) might have been unwittingly selling itself short.

Kindly let me hear from you not later than the end of June 2014 (a month from now!).

O.O. Akinkugbe

The responses I got from a substantial percentage of the heads of departments were positive and helpful. But sadly, a few had not addressed my request meaningfully. Some even sent a long list of publications by members of their departments. A few failed to respond at all and I surmised that such departments treated circulars of this nature with levity or did not fully comprehend the kernel of my enquiry. But at the end there was enough data to bite on.

I acknowledge with thanks those who made an effort to provide meaningful data and sympathize with those who failed a simple examination or who shied away from even attempting to confront the question. I will remit all these returns to the College of Medicine for archival purposes in the hope that non-respondents will remedy their non-compliance some day. If I had proceeded initially to assess departments without reference to contributions from their heads I would have exposed myself to undue bias. I reject the notion that non-respondents may have reacted that way because there was nothing to offer. This would amount to a cruel inference, but they still have time to retrieve their reputation.

There are three levels of **Originality**. The *first* I regard as making a fundamental observation and setting out to prove, identify its nature and, in the case of disease, its causation, its consequences and if possible, its prevention and cure. Very few

observations in Africa fall into this category. A classical example emanates from the man whose memory we honour today. In sub-Saharan Africa, G.L. Monekosso first drew attention to *Tropical Ataxic Neuropathy* but it was Osuntokun that gave a more detailed clinical description and went on, through a series of elegant epidemiological and biochemical studies to ascribe its causation to the effect of certain cyanogenetic glycosides found in cassava powder (gari) that had not been properly processed. Correction of its mode of preparation led to a gradual disappearance of this syndrome in communities in which it had hitherto been endemic.

The same can be said of *Burkitt's tumour* which surgeons recognized and excised repeatedly until Denis Burkitt in East Africa determined its structure and defined its natural history. Ibadan eventually weighed into its aetiopathogenesis and Ngu and his colleagues then linked its causation to a virus. Burkitt's tumour has today virtually disappeared from our hospital wards in Africa.

The *Aro Village concept* developed in the fifties by Lambo was applauded globally as a pioneering initiative in transcultural psychiatry, deserving of positive comment from the *Lancet* of that period. The role of aflatoxins derived from fungi in the causation of liver cancer in adult males was also delineated by Bassir and Bababunmi in biochemistry.

The **Second** order of originality features many of the contributions from Ibadan. They are made up of classic descriptions of departures from the norm as reflected in established clinical practice, of eponyms and of modification of clinical concepts in conformity with the vagaries of our culture and environment. It will be invidious at this stage to begin to name them chapter and verse, but we see this reflected in practically all

the departments, especially the earlier ones. Mention must however be made of:

- Child development studies
- Reproductive health
- Twinning
- Anaemia of pregnancy
- Trophoblastic tumours
- Malaria and nephrotic syndrome biochemical profiles in Africa,
- The story of guinea worm eradication,
- Observations on prolonging the life of the dialyzer
- The natural history of glaucoma in Africans
- Dementias
- Rural dental chair
- Histoplasmosis

I now wish in my final remarks to draw attention to that which necessity has forced upon us in order to be the mother of invention. Eruwa in the Ibarapa Local Government area of Oyo South, is the seat of indigenous rural health improvisation. Anyone who visits there to see Dr Yombo Awojobi perform cannot but marvel at his capacity for improvisation. He may not be appropriately described as the Newton, Faraday, Lister or Jenner of Africa, but he has succeeded in showing how to make maximum use of minimal resources and demonstrated that the best must not remain the enemy of the good.

In building a thriving medical practice in a rural environment he has made use of the natural elements and rare common sense (permit the Irishism) to sustain a credible infrastructure. Through appropriate engineering fabrication he has used his genius to surmount seemingly impossible challenges.

First, he rightly identified water and energy as twin imperatives and took steps to ensure a steady supply of both. He constructed an earth dam across a nearby seasonal stream, populated the dam with fish to control mosquito breeding and provide protein for patients and staff. Rain water from all the roofs are collected by concrete gutters and directed into reservoirs through the use of a home-made gasoline pump.

For energy, he fabricated 2 KVA to 10 KVA generators locally to satisfy myriads of specific demands, including x-ray services such that the daily consumption of diesel was only a gallon! With a home-made inverter that converts the direct voltage (DC) of the car battery to the alternating voltage of the generator or the national grid it was now possible to guarantee a continuous supply of electricity at night.

More intriguing is the fabrication of a coal furnace more efficient than the traditional diesel or gas burner, to operate the autoclave for sterilizing and the distiller for producing water, saline and glucose. Thus with the appropriate quality control in place, the hospital no longer needed to purchase sterile infusions, cleansing or fluids for use in the operating theatre. And what's more, the waste stem of maize cobs serves as a steady source of combustion fuel.

The genius of this remarkable surgeon also comes into play in other ways. The operating table was given the basic tilts of

elevation and lowering, using the hydraulic jack of a motor car, facilitating the positioning of the patient in diverse ways

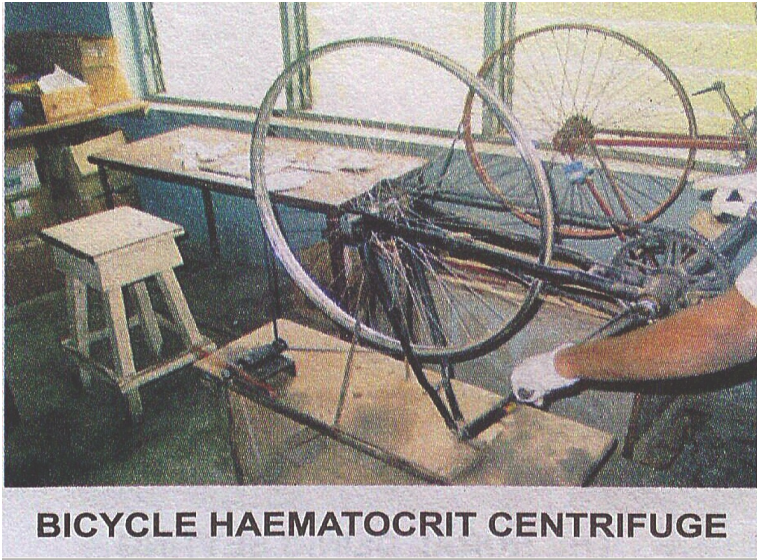
The autoclave, as earlier described, is made from a 50 kg domestic gas cooker with plumbing fittings to let out pressurized steam as the sterilizing agent.

The water distiller was made by the local aluminium smelter from an aluminium cylinder with galvanized plumbing pipes and helical copper tubing immersed in a water-cooler condenser. Water is distilled at the rate of 10 litres per hour. This contraption won the NASENI prize in 1992.

Histopathology services consist of specimens obtained from various body organs to ascertain the nature of the illness. To expedite diagnosis a specimen is handled locally by improvising ordinary candle-wax (in place of paraffin wax) and surgical or razor blades (in place of a microtome blade) and a small kerosene stove (in place of the electric plate for fixing the glass slides)

Perhaps the most ingenious contraption invented by him is the haematocrit centrifuge used to determine packed cell volume (PCV) in patients with anaemia. A manual centrifuge was fabricated from the rear wheel of the bicycle. It works on the principle of velocity ratio, and the centrifugal force generated in circular motion. The disc revolves at 5400 rpm, enough to pack the red cells in 5 minutes. A journal review in London, fascinated by the efficiency of this equipment, stated as follows:

***“The author is to be congratulated
for designing this piece of equipment”***



In Eruwa, Ibarapa, Nigeria.

And finally, for transportation, the surgeon's clinic has contrived a functional tricycle from the conventional motor-cycle and structured it as a village ambulance strong enough to negotiate rugged roads on emergencies.

I may, in giving these details, appear to be making too much of a song and dance regarding this kind of think-through challenge. This unusual surgeon-cum-engineer, rather than give ten reasons why an idea cannot work, confronts the challenges in the way that Piet Hein once remarked

Things worthy of attack

Show their strength by hitting back!

The big lesson to draw from this series of "how-to-do" initiatives is the need to adapt our scientific skills and training to be

congruent with the requirements of the environment, so that the poor workman will not continue to blame his tools. The scientist who waits for the most perfect set of equipment in order to put on his thinking cap will never succeed in making profound observations.

The flipside of this remarkable surgeon is the infectious enthusiasm and palpable leadership qualities that have galvanized his entire staff into sustained positive action, and makes them polyvalent. A records officer doubles as a painter, a plumber as a driver, a purchasing officer as the autoclave expert and a distilling unit officer as a carpenter!

Africa could be leading in the area of heat research and solar energy. The cooling system still relies heavily on research from the Western world. Re-inventing the wheel may not be needed but making the wheel more functional and relevant must be our remit. The most sophisticated research in solar energy takes place in temperate environments. Paradoxically a tropical belt so richly endowed with this potential source of energy is unable to prosecute research that would be the envy of the world. Even our electrical pundits are yet unable to refine the functional efficacy of the air-conditioner (a necessary ally in modern day activity in the home and the workplace) to a state that constitutes a pride to tropical ingenuity.

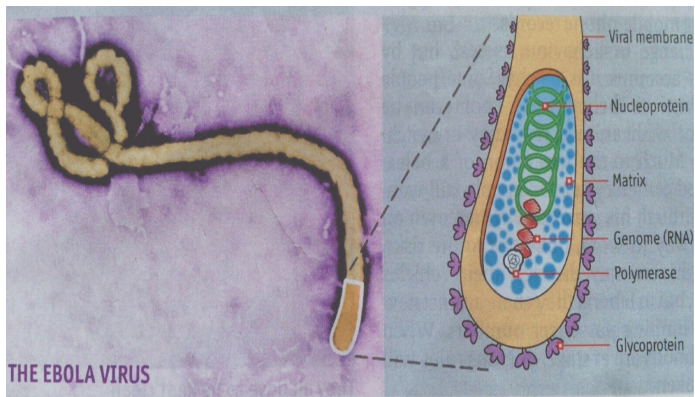
And now finally in medicine, Nigeria's human scientific capital has enough potential to become the leaders in:

- Sickle cell disorder
- Human nutrition studies & child growth and development
- Virology relating to HIV/AIDS, Lassa fever and even the current EBOLA

- Cardiovascular disease in Black populations
- Neurologic, liver, kidney, reproductive, pulmonary and psychiatric conditions peculiar to the African setting



A victim of Ebola virus in Liberia.



Yet there is a bewildering paradox of *disconnect* that can only be solved by resource, leadership, inspiration and perspiration.

If Kayode Osuntokun were alive today, we would, as we always did, be thinking on the same page. Ironically in the 60s we shared one small room in the central building of the UCH partitioned in a way that I passed through his room to get into mine. He did not allow that to stand in the way of positive thinking and earthshaking observations. Around the time of his painful demise I made certain observations in a book titled “ONE WORLD”. In a chapter addressing Constraints, Culture and Creativity, I stated:

In recent decades, the abuse of the democratic process and militarization of the polity have in many parts of the developing world given rise to new concerns. The unrelenting wave of assaults on the gains so painstakingly achieved in health, education and infrastructural development has threatened not only the social fabric, but also our intellectual capital. In many of these countries, it has left the citizenry, including committed scientists, deeply frustrated and forced many to flee their countries and seek solace in the industrialized milieu.

The work of medical scientists in the developing world will have little relevance if all their energies are spent in acquainting themselves with the work in developed countries and then imitating it. What is needed is the extension and enrichment of one's own tradition through a creative assimilation and adaptation of modern intellectual tradition, local

and cultural values and how traditional characteristics can be made, as in China, to relate scientific effort to the predominant modern world of rationalistic empiricism. It is our only passport to creativity and intellectual respectability.

In our national logo, the Eagle is a symbol of strength and ruggedness. In recent decades, that strength has been failing through a crisis of disconnect. In clinical parlance, it needs a drip. So, let us begin today to administer the right infusion.