

‘ANATOMY ROAD MAP AND PROSPECTS IN THE 21ST CENTURY’

**DELIVERED AT THE MAIDEN EDITION OF THE SPECIAL GUEST LECTURE
OF THE DEPARTMENT OF ANATOMY, COLLEGE OF HEALTH SCIENCES,
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By

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Mr Vice-Chancellor, Provost College of Health Sciences, Dean Faculty of Basic Medical Sciences, Heads of Departments, Faculty members, Students, Ladies and Gentlemen, I thank you for inviting me to be your Special Guest Lecturer at the maiden edition of the ‘Special Guest Lecture’ of the Department of Anatomy of Osun State University.

I am particularly pleased by this invitation because it gives me a chance to express my own views on the topic of Anatomy which has been very dear to my heart since I have been involved in the teaching of the subject for about 50 years.

WHAT IS ANATOMY? Anatomy is the study of the structure of something, in this case a human. Human anatomy deals with the way parts of human from molecules to bones interact to form a functional whole. The study of anatomy is distinct from the study of physiology, although the two are often paired. While anatomy deals with the structure of an organism, physiology deals with the ways the parts function together. For example, an anatomist may study the types of cells in the cardiac conducting system and how these cells are connected, while a physiologist would look at why and how the heart beats. Thus, anatomy and physiology are separate, but complimentary, studies of how an organism works.

The development of anatomy as a science extends from the earliest examination of sacrificial victims to the sophisticated analyses of the body by modern scientists. Human anatomy has a prestigious, and is considered to be the most prominent of the biological sciences in the 19th and early 20th centuries. Anatomy is the corner stone of a doctor’s education. The format and the amount of information being taught has evolved and changed along with the demands of the profession. Public dissection of the middle ages and early renaissance were in fact prosections. Prosection is the direction in which many current medical schools are heading in order to aid the teaching of anatomy and some argue that dissection is better.

ANCIENT ANATOMY

From Egypt-----1600 BC

Greece--- Hippocrates, a Greek physician active in the late 5th and early 4th centuries whose works have in great part survived demonstrated the basic understanding of the musculoskeletal structure. One of the greatest achievements of Hippocrates was that he was the first to discover the Tricuspid valve of the heart and its function which he documented in the treatise *On the Heart* in the *Hippocratic corpus*.

The first use of human cadavers for anatomical research occurred later in the 4th century when Herophilos and Erasistratus gained permission to perform live dissection, or vivisection, on criminals in Alexandria under the auspices of the Ptolemaic dynasty.

The final major anatomist of ancient times was Galen, active in the 2nd century. He compiled much of the knowledge obtained by previous writers, and furthered the inquiry into the functions of organs by performing vivisection on animals.

The study of anatomy flourished in the 17th and 18th centuries. The advent of printing press facilitated the exchange of ideas. Because the study of anatomy concerned observation and drawings, the popularity of the anatomist was equal to the quality of his drawing talents. Many famous artists studied anatomy, attended dissections, and published drawings for money, from Michelangelo to Rembrandt. For the first time, prominent universities taught anatomy through drawings rather than rely on knowledge of Latin. Contrary to popular belief, the Church neither objected to nor obstructed anatomical research (1). The increase in demand for cadavers led to rumours about anatomy murders.

In the 19th century, anatomists largely finalised and systematised descriptive human anatomy. The discipline also progressed to histology and developmental biology, not only of humans but also of animals. Extensive research was conducted in more areas of anatomy. Great Britain was particularly important in this research: demand for cadavers grew so great there that body-snatching and even anatomy murder came into use as a means of obtaining them (cadavers).

In response, the English Parliament passed the Anatomy Act in 1832, which finally provided for an adequate and legitimate supply of corpses by allowing dissection of destitutes. This relaxed restrictions on dissection provided a suitable environment for *Gray's Anatomy* textbook. This textbook was borne out of a need to create a single volume on anatomy for the travelling doctor. Nigeria did not enact anatomy act until 1933,

There developed a shift from public display of dissection in anatomy thereafter to a dissection carried out in classrooms. Public display of dissection (Prosection) to classroom dissection meant a reduction in the number of people who could benefit from a single cadaver. Another form of teaching anatomy began with the foundation of many medical schools and the provision of Medical museums. The museum was very important and a lot of effort was put into creating something very impressive. An example of such a museum can be seen in the Hunterian museum in the Royal College of Surgeons in London.

MODERN ANATOMY

Anatomical research in the past one hundred years has taken advantage of technological developments and growing understanding of sciences such as evolutionary and molecular biology to create a thorough understanding of the body's organs and structures. Medical devices such as MRI and CAT scanners have enabled researchers to study the organs of living people or dead ones. Progress today in anatomy is centred in the development, evolution and function of anatomical features, as the macroscopic aspects of human anatomy have been largely catalogued. The sub-field of non-human anatomy is particularly active as modern anatomists seek to understand basic organizing principles of anatomy through the use of advanced techniques ranging from finite element analysis to molecular biology.

With increasing demand on healthcare system and what could be deemed as chronic under training of doctors during the latter half of the 20th century, medical schools are now facing massive pressure to train as many doctors as possible.

This has meant in recent years cohort class size double or more than double to meet the demand. Anatomy department has had to accommodate the increasing number of students. This has led to a change in the direction of teaching Gross Anatomy by prosection rather than dissection; or by use of museum specimen. Prosection rather than dissection may be preferred because prosected specimen may be used by increasing number of students, while the number of students required for dissection of one cadaver may be too large. Very few people donate their body for dissection in medical schools. Nigerian culture does not allow for such donations. The hospitals now charge exorbitantly for unclaimed bodies in the mortuary. Anything from N20,000 to N50,000 per cadaver. There are more teaching aids available for teaching anatomy-plastic models, plastination of bodies, colour images and photographs. Recently a colleague at Jos University is advocating e-learning system. However, there is no better method of learning Gross anatomy than by dissection.

Anatomy teaching has changed considerably over the last 1,000 years, though it is still very much at the heart of the philosophy of modern Western Medicine. Without a good understanding of the arrangement of the human body, attempts to find the cause and cure of diseases become challenging.

Anatomy is often regarded as being a complete science, in that we know what and where most of the body is and does with little left to discover. However, with Histochemistry, cytochemistry, electron microscopy and in-depth of molecular biology of tissues of the body there is still a large amount of untapped knowledge of anatomy out there. The future of dissection may be uncertain and indeed, if pressure to obtain cadavers continues, even the few medical schools that continue to do dissection may have to halt. This hopefully will not reduce the number of people able to benefit from a single cadaver if current prosection methods become prevalent method of demonstrating gross anatomy.

ANATOMY IN NIGERIA

Professor A. Adeloje a highly qualified Neurosurgeon wrote a book on 'Early medical schools in Nigeria(2)'. About 14 students were admitted into The Higher College, Yaba, Lagos to study medicine in 1930. This is the beginning of the teaching of anatomy in Nigeria. He did not mention the names of the teachers of anatomy, but he gave the name of one Mr. Festus I. Okpa as a prosector in anatomy. He remarked that Mr. Okpa was so good that he was appointed acting lecturer in anatomy from 1942 to 1948.

In 1948, the University College, Ibadan was created with Special relationship with University of London. The students from Higher College Yaba, were moved to Ibadan as foundation students of the new University College. Professor Alastair Smith F.R.C.S (Edin.) was appointed to head the new department of anatomy. Mr. Okpa moved to Ibadan as a prosector in the new department. Professor Smith a Scot with a military background was known for his discipline and exemplary ability to draw on the blackboard when teaching. Between 1948 and 1962, he had a number of young British medical doctors that were appointed to various positions to teach anatomy to the students. One of such was Dr. Bunning later became Professor of Anatomy to establish the department of Anatomy at Ahmadu Bello University, Zaria. Professor Smith left Ibadan early in 1962 because of ill-health. In his fourteen years in Ibadan he left a legacy of a disciplinarian and a well established department. Professor Harper from the department of anatomy University College of the West Indies succeeded Professor Smith late in 1962, but left just before the civil war in Nigeria started.

Dr. (Later) Professor T. Adesanya Ige-Grillo L.R.C.P., L.R.C.S, (Ireland) B.A., Ph.D, (Cambridge) the first Nigerian medical doctor with a Ph.D. in anatomy from Cambridge University. He was appointed lecturer in 1961. Professor Grillo worked hard to establish a training program for young Nigerian anatomists while was in Ibadan. He left Ibadan for Ife in April 1972 to become the Foundation Dean of the new Faculty of Health Science.

College of Medicine University of Lagos was established in 1962. A number of Pakistani medically trained anatomists were appointed to start the department of anatomy, namely Professor Mohuiddin and later Professor Lasi.

In February 1963 Dr. (now Professor) A.B.O. Desalu was appointed Lecturer II at the University of Ibadan. A young medically qualified graduate from University of Bristol, England, was sent to Yale University, U.S.A. for training as an anatomist under the auspices of The Rockefeller Foundation. After two years training Dr. Desalu returned to Ibadan with a Master of Science degree from Yale. He continued with his research and registered for a Ph.D. and obtained a Ph.D .degree of Ibadan.

TRAINING OF ANATOMISTS IN NIGERIA

In 1963 the Faculty of Medicine, University of Ibadan approved a program of B. Sc (Anatomy) intercalated in which medical students with a distinction or high pass in anatomy at the 2nd M.B. will be allowed to spend an extra year in anatomy before proceeding to the clinical program. The one year program involves taking further courses in anatomy, final examination in anatomy and presentation of a dissertation to earn a degree of B.Sc. It was expected such students will be allowed to be demonstrators in anatomy during their clinical years and in so doing get them to be interested to take on anatomy as a career after graduating in medicine. Between 1965 and 1971 when the program was discontinued, about 42 students graduated with B. Sc (Anatomy). Only one of such students came back to obtain a Ph.D. and remained as an anatomist today. In addition, the University of Ibadan also started a program of B.Sc. (Medical Laboratory Technology) in such disciplines as Anatomy, Physiology, Chemical Pathology, and Microbiology. Five of such students graduated with a degree in anatomy. Three of them are still in anatomy today.

College of Medicine University of Lagos sent Dr. (now late Professor) Obuoforibo, one of her foundation medical graduates to Sheffield University to train as an anatomist. He obtained a Ph.D. in anatomy and returned to Lagos in 1972 as a Lecturer.

Between 1974 and 1979 a number of medical graduates from the College of Medicine, University of Lagos were sent to University of Nebraska U.S.A. to train as

anatomists. Among them are Dr (now Professor) Ashiru, Dr. Dada and one other. Dr. Ashiru returned to Lagos and rose to become Professor of Anatomy in the College of Medicine.

When Professor T. Adesanya Ige-Grillo was appointed Dean of the new Faculty of Health Sciences at University of Ife (Now Obafemi Awolowo University), he started a revolutionary medical curriculum in which all medical students will spend the first four years to obtain a B. Sc degree in the Faculty of Basic Medical Science before proceeding to the clinical science part of the curriculum. It was expected that such graduates in anatomy or physiology will return to be teachers in the discipline. A number of students from this program obtained the B. Sc degree. I know of only one of them in anatomy today.

Over the years a number of Universities have set up postgraduate programs which included M. Sc and Ph. D. in anatomy with the hope that medical graduates with interest in anatomy can come and obtain a higher degree in anatomy while teaching in the department. The present lecturer is the first medically qualified person to obtain a Ph.D. of the University of Ibadan. Others both medically qualified and non-medically qualified have since obtained M. Sc. and Ph. D. and remained teachers in Anatomy.

TRENDS IN ANATOMY

I do not know when most Universities in Nigeria started offering undergraduate degrees in anatomy. It must have been decided that the only way to go to train anatomists must be by offering a B. Sc. degree, following which some may proceed to M. Sc. and Ph. D. As a result of this, there are a number of graduates with B. Sc. (Anatomy) who are not medical doctors. I believe majority of these graduates intended to enter the University to study medicine but could not get admission. The intention might be to go into medicine later. With little chance of getting into medicine they must have decided to proceed to a postgraduate program in anatomy. Some of these graduates have now obtained M. Sc. and /or Ph. D. and are now making a career in anatomy. At this point I will like to point out that what is happening in Nigeria is not very much different from what is happening in the rest of the world. There are many anatomists the world over who are not medically qualified, many of them in the United States of America. We only need to know the laws that govern the practice of anatomy in Nigeria.

About 80 years ago the colonial government enacted an act known as Anatomy Act on 30th day of March 1933. This act is in Chapter 17 Laws of the Federation of Nigeria 1990. There are twelve sections of the act .

1. Short title: This act may be cited as The Anatomy act.

2. Minister of Health may grant licences to practice anatomy
3. Executors or other persons having lawful custody of bodies may permit them to undergo anatomical examination.
4. Provision in case of persons directing anatomical examination after their death.
5. Body not to be removed without certificate.
6. Superintendent of school of anatomy may receive bodies for anatomical examination.
7. Superintendent of school of anatomy to receive with a certificate as aforesaid and keep record of particulars of deceased.
8. How bodies are to be removed for examination.
9. Persons not to be liable for prosecution for having in their possession human bodies.
10. Act not to extend or prohibit post-mortem examination directed by competent authority.
11. Penalty for contravention of this Act.
12. Power to make regulations prescribing forms

For the purpose of this lecture only section 2 of this act is relevant. The details of this section are as follows:

- (i) It shall be lawful for the Minister of Health to grant a licence to practice anatomy to the superintendent of any school of anatomy.
- (ii) A licence granted as aforesaid shall be deemed to authorise the practice of anatomy in such school by any teacher or medical practitioner employed therein and by any student attending a course of studies at such school when working under the supervision of such superintendent, teacher or medical practitioner.

There are 25 accredited medical schools in Nigeria and 6 partially accredited schools making a total of 31. I wonder how many of these schools have obtained the licence to practice anatomy from the Minister of Health.

Very few medical doctors like to take on anatomy teaching as a profession. The majority like to practice the profession of medicine. As a result of this there is a dearth of anatomists in many medical schools and many more schools are being created. The vacancies thus created will need to be filled with non-medically trained anatomists such as those with B. Sc. and M. Sc. who may go on to Ph. D. In this respect it is pertinent to point out that in the United States of America; most of the teachers in the medical schools are not medically qualified.

A paper by Onakpoya et. al(3). concluded the ‘Anatomy as a subject is perceived positively by clinical medical students, but the choice as a career option is low, attempts at increasing career interest is needful’

A survey of attitude of lecturers and students of anatomy towards making anatomy career friendly in Nigeria by Al Peter et.al(4) concluded that majority in this survey believed that the present anatomy curriculum needs urgent review and major reconstructing to make it career friendly.

There is a need to introduce clinical experience and industrial training in relevant areas. There is also a need to introduce sub-discipline as tools to encourage and motivate students for improved performance, I could not agree more. Facilities must be improved and students should spend more time on practical experience. This will help to improve students’ satisfaction and performance. Anatomy must not be seen as a medical appendage for the training of medical students, but as a career course with a well outlined curriculum to support the training of its undergraduate.

PROSPECTS IN THE 21ST CENTURY

There is a great need for anatomists all over the world, particularly, medically qualified anatomists. Alas, this trend is not new and will likely continue for some time to come. Therefore we have to fall back on non-medically qualified graduates in our Universities. In order to train these graduates to become anatomy teachers, we must provide opportunity for postgraduate training. This means enough funding for the purchase of necessary equipments and chemicals as well as research grants. The B. Sc. graduates must have opportunity for postgraduate courses relevant to the different disciplines. Apart from Human gross anatomy, postgraduate courses must be available in such areas as Neuroscience, Histochemistry, Cytochemistry, Electron-Microscopy, Physical anthropology, etc. that students can take to make them fully qualified as anatomy teachers. They must also have opportunity for research work and enough funding to follow up on their research. Opportunities abound in medical schools, schools of nursing, schools of physiotherapy and school of radiography for teachers of anatomy. In addition, those who are research oriented, with enough funding, there are many research institutes that will need the services of research scientists in the sub-discipline of anatomy. There is a need for prosectors in our medical schools to prepare prosected specimen both for teaching and museum specimen.

Anatomy graduates who are not research oriented can take on such technical work including such areas as histology and electron-microscopy. Finally, for those who are

business minded and entrepreneurial, they can set up a funeral home for embalming and preservation of bodies before funerals.

I hope I have been able to give you my personal view of the development of the profession of ANATOMY in Nigeria to stimulate further discussion on the topic. The future is for those who are coming after us to improve on and stimulate others to make the profession more attractive.

THANK YOU ALL FOR LISTENING.

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BIOGRAPHY OF PROFESSOR A.B.O. DESALU

The family of Mr. Ayodele Desalu and Mrs Theodosia Olaoluwa Desalu (Nee Pearce) of Lagos State of Nigeria was blessed with a bouncing baby boy on the 19th day of May, 1932 who was named Babajide Olukayo.

The young Olukayo started his educational career at CMS Girl's School Lagos after which he went to CMS Grammar School, Bariga preparatory to his secondary education.

He later proceeded to Igbobi College, Yaba where he was from 1947 to 1951 for his secondary education. He was on Nigerian Federal Government Scholarship to Bristol University in England between 1956 and 1961 where he had his Bachelor of Medicine and Bachelor of Chiropody (MB, ChB) degree. He was also on Rockefeller Foundation Fellowship to Yale University in the United State of America between 1963 and 1965, where he had his Master of Science (MS) in Anatomy. He had, to his distinction, a Doctor of Philosophy (Ph.D) degree in Anatomy from the University of Ibadan in 1973.

Since his acquisition of basic qualifications, Professor A.B.O. Desalu has had a very vast experience and has worked in different places within and outside Nigeria, and in various capacities.

He was

- A pre-registration House Physician and Surgeon at Bristol Royal Infirmary, Bristol in England between August 1961 and July 1962.
- A post-registration House Officer in Paediatrics at the University College Hospital (U.C.H.), Ibadan between August 1962 and February 1963
- A lecturer II in Anatomy at the University of Ibadan between February 1963 an July 1966
- A Researcher Fellow in the Department of anatomy, Yale University School of Medicine in the United State of America between August 1963 and July 1965
- A lecturer I in the Department of Anatomy, University of Ibadan between July 1966 and September 1971
- A Senior Lecturer in the Department of Anatomy, University of Ibadan between October 1971 and November 1975
- And a Professor of Anatomy at the University of Ibadan between December 1975 and September 1992.

He was also

- A Visiting Professor of Anatomy to University of Makerere, Kampala in Uganda, sponsored by the World Health Organisation between July and September 1976
- A Visiting Professor of Anatomy to University of West Indies, Kingston in Jamaica between October 1981 and June 1982
- A Professor of Anatomy to University of West Indies between January 1991 and March 1992
- And he is currently a Visiting Professor of Anatomy at Ben Carson Senior School of Medicine, Babcock University, Ilishan Remo in Ogun Statte Nigeria since September 2009.

Professor Desalu has, on different occasions been involved in several extra-mural activities. Some of these are as

- A member of Senate of the University of Ibadan during 1968/89 and 1989/90 academic years
- Chairman of Business Committee of Senate of University of Ibadan during 1971/72 and 1972/73 academic years
- Senate member in Housing Allocating Committee of University of Ibadan Council from 1971/72 academic year to 1975/76 academic year
- Sub-Dean (Pre-Clinical) Faculty of Medicine between 1970 and 1972
- Chairman, Housing Allocating Committee between 1979 and 1984.
- Dean, Faculty of Basic Medical Sciences, University of Ibadan between 1984 and 1986
- Deputy Provost, College of Medicine, University of Ibadan Between 1988 and 1990
- Chairman, Promotions Committee, Ross University School of Medicine, Commonwealth of Dominica, West Indies between 1992 and 2001
- Associate Dean of Education, Ross University School of Medicine, Commonwealth of Dominica, West Indies between 1995 and 2007.
- Vice President, Science Association of Nigeria between 1976 and 1978
- Vice President, Anatomical Society of West Africa between 1984 and 1990
- Chairman, Department of Anatomy, U.I. between 1975 – 1976, 1980 – 1984 and also between 1986 – 1988.

- Professor Desalu served as an external examiner in Anatomy to different Medical Colleges and Universities within and outside Nigeria, with the inclusion of National Postgraduate Medical College and West African Postgraduate Colleges of Surgeons and Physicians. He is a member of many research and learned societies and has several quality local, national and international peer-reviewed publications in very reputable journals and books.

Professor Ayodele Babajide Olukayo DESALU, the octogenarian and teacher of Professors, is a very successful monogamist and father/grandfather of learned colleagues.