MAN KNOW THYSELF AND YOU
SHALL OBTAIN THE HEALING POWER

By
OLADAPPO A. ASHIRU

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By

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In accordance with the tradition of the University of Lagos, Inaugural Lectures are to be given by the university's new professors. I am grateful to the university for the opportunity given me to deliver this inaugural lecture. Although it is almost seven years since my appointment to a Chair in the Department of Anatomy, I feel honoured on this occasion to discharge this duty to such an august audience as gathered here today; particularly so because this is the first inaugural lecture in anatomy in this university, and probably in this country. It is also the first to be delivered by an alumnus of the College of Medicine.

Talking about inaugural lectures, as student one cannot but remember some of the stories we were told. There was the case of a professor who gave his inaugural lecture sitting down. There was another one who during the lecture wanted to demonstrate that he could control his heart beat and stop it contracting for moments. Unfortunately, on this occasion he could not revive the heart. The confusion that arose made it difficult for resuscitation. It also reminded me of the chaos that arose during a visit of traditional healers to the Minister of Health. One of them collapsed, obviously from hypoglycemia. The colleagues had a field-day displaying their ample stock of incantations and their magical powers. But of course to no avail! There were several other stories especially in the 18th Century and early 19th Century.

I do not intend to do any of such today. If it were a lecture purely for medical students, they would say to me as it is their practice "Here I am, feed me with knowledge while you entertain me". I believe that might be too presumptuous of me in this gathering of town and gown.
What I will rather do today is give a public exposition of what I profess in the realm of anatomy and my experiences. Like a modern medical educator, I should say specifically that at the end of this inaugural lecture, the audience would be able to define anatomy, appreciate its historical development and recognise some of the roles played by anatomy in the healing process of man and probably appreciate my research work towards the healing process.

What Anatomy is

Anatomy is the science of the structure of the body. It tells us what are the component parts of the body as a whole; it deals with certain tissues which are moulded together to form systems, and it provides for us a map which must be referred to often on our numerous excursions into the realms of disease.

I am certain that anatomy is not a strange word to this audience. People have cause to use it in one form or the other. Recently, someone wrote about the Anatomy of SAP. In the medical circle anatomy to many is a much dreaded subject. It connotes fear, boredom, or bogeyman for medical students!

It can be regarded as the oldest subject and the father of Medicine. The justification is available in the laws of creation. It says in the Holy Bible; Genesis 1:26:-

"In the beginning, God created man in His own IMAGE"

That image is Anatomy. The Holy Koran also has this to say about creation:

"The bones were fashioned out of the shapeless lump and clothed with flesh"

and that was man; Koran 23:15.

Historical Overview

It is important to reflect on the early anatomist, not only because it is necessary for us to praise famous men, but also it is through an analysis of their works that I have taken further inspirations leading to the title of this lecture which is Man Know Thyself And You Shall Obtain The Healing Power.

After deciding on this topic almost nine months ago, I discovered to my satisfaction that the Newsweek Magazine of the week of September 21st, 1990, devoted a front cover story on "The Power To Heal". The write-up made good reference to the development of modern scientific systems of medicine over the past 100 years. Examples were given about how the arrival of penicillin, other antibiotics, vaccines, etc. have changed the curative methods and have saved millions of lives. Mention was made of the Stone Age treatment as in Egypt, where Egyptians used herbal medicine to cure crocodile bite. The Peruvians cut holes in the skulls of the living to provide diseases with an avenue of escape. We can also reflect on the practice of our traditional healers. It was made clear that through all ages and up to the Year 2000, these various healers made use of anatomical knowledge one way or the other.

The Early Anatomist

Most of the early anatomists acquired the knowledge of anatomy and used this knowledge in the healing process through one practice of surgery, medicine, obstetrics and gynaecology, pathology, and other disciplines. We are told of the Hippocratic Collection (400 B.C.). He recognised the cleft between the cerebral hemispheres and made a belief that the brain is associated with intelligence.

Aristotle (384-322 B.C): He did a lot of work in neuroanatomy. He postulated that the brain controls the pituitary gland. He claimed that some secretions were produced through the nose to cool the body!
Galen (A.D 129-199): He was a well-known dissector and experimentalist. He classified the cranial nerves in the Head and Neck region. He also worked on spinal cord functions. Some of this early knowledge are today being used in the management of spinal cord injuries and diseases like spinal bifida.

Vesalius Andreas (1514-1564): Professor of Anatomy at Padua and later, Bologna and Pisa; physician to Charles V and Philip II of Spain. He had received a lot of medical adulation. He revised the whole field of anatomy by his own dissections and changed the scope of medical practice.

Falloppio (Fallopius) Gabriele (1523-1563): Professor of Surgery in Padua. He described the Tuba-Uterina (fallopian tube). In this century, the fallopian tube is the focus of a high-powered gynecological and endocrine practice.

Vater, Abraham (1684-1751): Professor of Anatomy, Botany, Pathology and Therapeutics in Wittenberg. He discovered the ampulla of Vater of the bile duct. The blockage of this ampulla could lead to gall bladder disease.

Meckel, Johann Friedrich (1724-1774) Professor of Anatomy, Botany, and Gynecology in Berlin. He described the Meckel's Cave in the cranial cavity of the skull. This is the site of a very painful clinical condition called Trigeminal Neuralgia (Tic Douloureux). It is now treated by injecting alcohol into the Meckel's Cave.

Meckel, Johann Friedrich (1781-1833): Professor of Anatomy and Surgery, and grandson of the preceding professor. He described the Meckel's Cartilage. The development of the jaw bone and the management of cleft lip and palate make use of this information.

Monro, Alexander (1733-1817) (Secundus): He succeeded his father, Alexander Monro (Primus) as Professor of Anatomy in Edinburgh. Interestingly, between this father and son and the grandson, they occupied the Chair of Anatomy in Edinburgh for over 100 years. He described the interventricular foramen of Monro. This foramen can be blocked in neonates. A disorder described as hydrocephalus would result. This can now be effectively managed.

Colles, Abraham (1773-1843): Professor of Anatomy and Surgery in Dublin from 1804 to 1836. He described the Colles' fracture. This is a fracture on the distal 3rd of the wrist. It is almost an everyday occurrence in orthopaedic surgery.

Sir Bowman William Paget (1816-1892): Professor of Anatomy and Physiology, at King's College, London (1848-1856). He was a leading ophthalmic surgeon in England. He discovered the capsules surrounding the glomerulus in the kidney. He also described the membrane - anterior "elastic" of the cornea. Today a lot of kidney problems do result from abnormalities of this membrane, and a good degree of ophthalmic surgery is centered around the Bowman membrane. I will leave these just to mention a few.

Apart from these, they had also used this knowledge for other purposes. The movement towards naturalism amongst artist of the Renaissance period in Europe in the late 15th and early 16th centuries culminated in Leonardo da Vinci style of painting (1452-1519). Like his great contemporaries, Michelangelo and Raphael, they turned to dissection for direct information on the human structure. This was just after the period when anatomical dissection was a guarded secret and very restricted. Some even went to the graveside to quietly dig up bodies, and transfer them to hidden places for dissection.

Anatomy as an Instrument of Domination

One other use of Anatomy is the power of domination. In the course of the 18th and 19th centuries, the linguistics, historians and artists had all collected elements for building a national culture in many parts of Europe. It
gradually became the duty of anatomists to raise the
national spirit further by demonstrating that every partic-

ular nation was composed of people having similar physical
characteristics, now called a race.

The interest of the anatomists for racial problems
could be called "commissioned research". The increasing
knowledge of the theories of Charles Darwin (a renowned
evolution scientist) contributed to the attempt to mark
population differences by certain hereditary factors. It was
purely an egocentric affair. The early anthropologists soon
started to suppose also structural weaknesses, which could
allow them to classify some people as physically "primitive"
or "barbarous" and consequently living on a lower level of
cultural evolution.

An example of a race that suffered such classification
was the Finnish people. In June this year (1990), I was
invited as a guest speaker by the Finnish Anatomy in Turku,
during the celebration of the 350 years of Anatomy in
Finland. The theme was the Contribution of Anatomy to the
Development of Medicine and the Medical Profession.
Professor Niemi, a Professor of Anatomy in Finland in his
paper titled "Finnish Anatomist in Search of the Origin of
the Finns" told us of how the earliest Professor of Anatomy
in Finland, was a Swedish. The Swede anatomist compared two
Lapp skulls, one Finnish skull and one Mongol skull and
stated that the Finnish skull resembled the Mongol one, who
at that time were considered an inferior race to the
Caucasians. It took almost 160 years when the Finnish had
their own first Professor of Anatomy before they could prove
that there were no traces of a Mongolian race in Finn. Today
we know that the human anatomy is the same regardless.

The first modern dissection of the body was performed
in Cremona in A.D. 1286 and followed in A.D. 1316 in Bologna
in Italy by Mondino. As other European countries witnessed
dissection, so did their cultural awareness, education and
medical care improve. In Nigeria, the first dissection was
in Lagos at the then Yaba Medical School. This school
existed (I dare say "not prospered") during the colonial
era. It did not survive the decolonisation process; it
disappeared when the University of Ibadan was born in 1948.

However, some of the products of that school have made the
best of the contribution to medicine; one of such products
became the Director General of AFMS sometime ago. The next
dissection was in Ibadan in 1948 while Lagos had a second
dissection in 1962.

The Anatomist and Medical Education

One vital quality of anatomists is the ability to pass on
their knowledge to others. In the words of Plato:

"Those having torches will pass them on to others".

I must say that the early anatomists were rather didactic in
their transfer technique. They were just difficult if not
impossible teachers.

In my own experience in the medical school when we got
to the anatomy class, the lectures and dissection started
like a bang. The Professor warned that he would not remember
your face for bad behaviour otherwise you would fail
completely. It was anatomy with fear of failure and possible
ejection from the medical school. The news of the previous
class which had a pass rate of 14 out of 88 did not help to
diffuse our tension. It was during this period that I took
up the challenge. The interest in anatomy developed and soon
I became a demonstrator in my class. The advent of Professor
Lasi, the former Professor in our Department increased our
appetite for the subject. He was very good with anatomical
pneumonics. For instance he taught us that the relationship
of structures in the neurovascular bundle is like a VAN
(Vein, Artery and Nerve). There were many others. At the end
of our anatomy year we had a 90 per cent pass with two
distinctions. The following year I was appointed Student
Demonstrator in Anatomy. That more or less sealed my
marriage into this discipline.

Mr. Vice Chancellor, the anatomists even up till today
are so preoccupied with passing the torch of knowledge to
others. They put more premium on this than financial remu-
ne ration. The late 1970's witnessed the revolution in the
techniques of medical education. The anatomists were again not left out in the frontiers of this revolution. The modern anatomist can be described as having the academic knowledge and research competence (usually MD, Ph.D), some with MD, Ph.D, FRCS, above all with motivated teaching and skills. Self instructional packages were developed at this time (1970). Clinical and Applied Anatomy were given a greater share of the curriculum. Furthermore, good students performance was the target.

I was fortunate to be sent to America at this period. It could almost be likened to the so-called WHO immersion training, except that in this case it was a deep and prolonged immersion.

At this juncture, the founding fathers of the medical school, Professors H.O. Thomas, Felix Dosekun, and E. Ade. Elebute, cannot but be remembered for their foresight in staff training, development and commitment to excellence. It was such training that got me to Nebraska, one of the Top 10 medical schools in North America. The process of becoming an anatomist soon began in earnest. The Nebraska program was geared to producing a competent Human Anatomist, a modern Medical Educator and a Medical Scientist.

Modern Anatomy in Lagos

Today in Lagos, in the Department of Anatomy, students learn anatomy with relative ease. The pass rate is impressive, students/teachers interaction and motivation are pursued with vigour. Prizes are given for good performance and students' evaluation of teachers performances are effectively utilised. We are trying to pass on the torch.

The field of anatomy has been expanded tremendously, for example in Sports Medicine. Here some particular groups of muscles are developed for special sporting events. The ladies have all become anatomists in this 20th Century. Led into action by Jane Fonda and others, physical exercises with the walk-out techniques are taking the knowledge of the muscle actions and joint activities. The net result is healing, good body and health. Professor Didio, the President of the International Federation of Anatomists said recently in Nancy, Paris, in his lecture titled "The Anatomy of Beauty" that "the women folk are directly or indirectly making use of anatomy more and more for good health and the Plastic Surgeon needs Anatomy to reconstruct beauty".

In summary, students' interest in anatomy has been increased. In Lagos some of our anatomy lecturers now have a health fitness centre for physical exercise. They call it the A2 Aerobics Club.

The Anatomy of the Reproductive System

This is the area of my major contribution to science and the healing process.

I spent my one-year Youth Service in the Nigerian Navy in the rank of a surgeon lieutenant, a posting which I thoroughly enjoyed with full excellent comradeship. I realised at times that my knowledge of anatomy was probably most invaluable in clinical diagnosis and treatment. If the pain is in the abdomen once I localised it to the epigastric region, I was sure that in 70 per cent of the cases, it was peptic ulcer, while pain in the back lumbar region was likely a kidney problem. The need therefore for a greater understanding of the human body was clear. Although my superior officers did encourage my staying in the Navy I could not.

My first experience in becoming part of this so-called "know thyself and obtain the healing power" was gradual. In 1977, I started a series of experiments in the laboratory of Dr. Blake. WHY? We wanted to know more about the mechanisms controlling ovulation at cellular and molecular biology level and deal with the hypothalamus and the reproductive system. It is also referred to as reproductive endocrinology. Now let us look at the experiments.

What Was Known: At this time it was already recognised that ovulation is dependent on Luteinizing Hormone Releasing Hormone (LHRH) a peptide hormone released by the hypothalamus to regulate the secretion of the pituitary gonadotropic
hormones, LH (Luteinizing Hormone) and FSH, (Follicle Stimulating Hormone). These two hormones are necessary for ovulation in the female and for sperm production in the male. The two necessary parameters are needed for reproduction of man - "go ye and multiply".

The existence of hypothalamic substance(s) regulating the anterior pituitary function dates back to 300 B.C. when Aristotle speculated that the brain may influence the pituitary. By 1977, the full pattern of LH and the first phase of FSH were already documented (Daane & Parlow, 1971; Gay, 1970; and elegantly described in detail by Blake in 1976). This was made possible by the advent of radioimmunoassay. This is a highly sophisticated, sensitive and advanced technique for measuring hormone levels in the blood.

As a result of the following experiments the speaker was able to characterise the second phase of FSH release. It was a 24-hour experiment for two weeks with few hours break in between. We were also able to determine the mechanisms regulating some aspects of ovulation. As a result of these experiments, we were able to demonstrate the following:

1) The second phase of FSH release was characterised in detail; and
2) That LHRH can restore FSH secretion and lead to ovulation.

This was my first arrival into the science world. It was published in Life Science in 1978. To me it was just the publication of some research work I did and that was it. I was to feel the import of this work much later. Within two months of the publication, I was bombarded with several reprint request from well over 500 scientists. The healing power from this work is that today, LHRH analogue called Buserelin or Suprefact are now used in the treatment of hypothalamic amenorrhoea, in superovulation in women and sperm production in the male. We have been able to use this hormone in this environment with success in superovulation in women. The same drug has also become useful in the treatment of fibroid and endometriosis.

The FSH Positive Feedback

In search of the mechanisms regulating the second phase of FSH, experiments were done to determine factors leading to the second phase FSH release. The results of this work showed that the second phase of FSH is dependent on the occurrence of the first FSH and the pre-ovulation LH surge. This can be summarised as the FSH feedback which I described in 1979 in Endocrinology. In simple term, injection of exogenous FSH causes additional endogenous FSH secretion and partial ovulation. This publication was a landmark discovery in science. It was followed by a series of experiments and publications between 1979 and 1982. In those other experiments I investigated the role of estrogen, progesterone, inhibin, and other hormones on ovulation. It was concluded that such factors as estrogen causes suppression while inhibin will block ovulation.

Today FSH is now available in partially purified form called pergonal and the pure form called metrodin. They can be injected artificially (exogenously) to cause superovulation through the development of more follicles. This has provided treatment in patients undergoing in-vitro fertilisation or those who do not ovulate naturally due to secretion of low FSH. In our hands, the pregnancy rate following pergonal and or metrodin in the natural anovulatory cycles have been very impressive, pregnancy rate of up to 70 per cent have been obtained.

As a result of these findings, it has now been possible to give a definitive format for the control of ovulation in mammals including man.

The Setting up of an Endocrine Laboratory in the Third World

With such landmark publications, leaving the United States of America in 1980 for Nigeria was to me like the challenge of a legacy - to borrow a word from Professor Akin Adesola...
in his recent H.O. Thomas Memorial Lecture. In reference to the legacy left by Professor H.O. Thomas, in this case I was leaving a legacy in Nebraska. I had to prove that on getting to Nigeria I could conduct and sustain the same level of research as I did in the United States of America.

The bench work was started with research grants from the College of Medicine (N12,000.00), the Rockefeller Foundation ($35,000.00), and active collaboration and seed research support by Dr. Blake in Nebraska. Between 1980 and 1982, a fully operative reproductive endocrinology laboratory had been set up. We were able to do radioimmunoassay of hormones in humans and some experimental animals. We had a comprehensive set-up for animal experimentation. They were later reinforced by similar set-up for humans. This infrastructure enabled me to do the following:

(a) Conduct animal research as a follow-up to the earlier work in the United States of America and to test any new concepts without constraint;

(b) Provide hormonal services for patient management in reproductive endocrinology;

(c) Explore the area of male reproductive anatomy which hitherto had been pursued vigorously; and

(d) Provide avenue of stimulating, inspiring, and training of would-be anatomists. To-date, 14 postgraduate students have been trained. One postdoctoral, 5 M.Phil, 6 M.Sc. and 2 Ph.D. Four have sought greener pastures in the United States as assistant and associate Professors, some are in senior positions in other Universities in the country, with only four still around.

During this period we conducted more experiments on the ovulatory process. One interesting study showed that animals could still ovulate even if the entire brain was removed and the pituitary gland left intact. It was published as a major contribution to science in endocrinology in 1985.

Today we can now use hormone to shut off the brain and still cause ovulation to occur when we treat patient for in-vitro fertilisation and embryo transfer. It enables us to decide when exactly we can operate a patient to remove her eggs. For instance, if ovulation would normally occur on a Saturday or Sunday, we can artificially bring the ovulation to Monday or Tuesday if we shut off the brain. This procedure also removes the effect of stress from the brain on ovulation.

Morphometric Anatomy of the Male Reproductive System

The next system investigated was the male reproductive system. We set out to investigate morphologically the mechanisms controlling the male reproductive system, especially in terms of sperm production. (It is noteworthy to state that 40 per cent infertility is due to abnormality from the male reproductive system generally termed the "sperm factor"). It was observed that:

(a) There is compensatory hypertrophy in the cryptorchid testis (undescended testis);

(b) Testosterone is a useful hormone in preventing degeneration in cryptorchid testis especially in the early stages – published in Journal of Steroid Biochemistry; first presented at the 5th Hormonal Congress in Israel in 1982; and

(c) Alcohol has a destructive action on the testicular histology and sperm motility – Published in Andrology Journal; first presented at Andrology meeting in Philadelphia in 1983.

The implication of these studies are that:

(1) Children must be examined in childhood to ascertain the presence of the two testes. If not it needs surgical repair;
Testosterone may have some benefit in cases of poor sperm activities; and

Finally, alcohol has a suppressive effect on testicular activity and sperm count.

The Art of Reproductive Endocrinology in the Laboratory/Clinical Situation

Hormonal measurements alone does not give the best answer to reproductive management. The results must be taken together with the living anatomy of the individual (clinical examination). In the last 10 years, a number of determinations were made and correlation with their physical assessments of the organs. I will like to share with you some of the results which include:

(a) Several patients presented with infertility problems; they had been classified as unexplained infertility. Endocrine evaluation revealed galactorrhea and raised prolactin levels in the blood. Management showed a return to normal cycle with 6 weeks and up to 70 per cent pregnancy with the use of bromocryptine and anti-prolactin medication;

(b) Five patients with hormonal problems and infertility had no pregnancy despite several treatments. Routine anatomical determinants showed enlarged thyroid. The use of iodide salt led to reduction in thyroid weight and pregnancy within two months of therapy. Three of the patients delivered while the other two became pregnant and had their babies when thyroid hormone (thyroxine supplement) was added to the treatment regime; and

(c) The use of super ovulatory procedure in infertility. The knowledge of the ovulatory mechanisms enabled me to use clomid, pergonal, metrodin, and hCG in super ovulation regime. The pregnancy rate was up to 65 per cent.

The Cellular Anatomy of the Sperm and Oocyte

When it became clear that some patients could not be treated of their infertility problem, the need for further experiments on the process of sperm and ovum interaction commenced. The research in this field started as early as 1959 and by 1978 led to the delivery of the first world test-tube baby (Louise Brown). Today about 3,000 babies have been born through this process all over the world. Mr. Vice-Chancellor, this university joined the club of this medical achievers in 1984 and made a delivery in 1989. Three other subsequent deliveries have since followed. I will devote some time to expatiate on this topical subject of "test-tube baby", which is best described in medical sciences as extra-corporeal fertilisation. I am very sure this gathering would want some information on it. I will just like to put on record that the first congratulatory message and further words of encouragement was sent by no other person than Prof. J.O. Akinosi - the very Provost.

What is Extra-Corporeal Fertilisation?

It is the union of the egg and the sperm out of the woman's body. The need for extra-corporeal fertilisation has been there for many centuries. Combined statistics on infertility now indicate that as many as 35 per cent of infertile patients could benefit from the technique.

Historical Overview

1. Anatomical Knowledge of the Process of Sperm Capacitation

If a Nobel Prize would be given for extra-corporeal fertilisation, one of those who will be entitled to receive such is Chang. He first devised the process of sperm
capacitation. This is to mimic outside the body the changes that occur to the sperm from the cervix to the fallopian tube which enables it to fertilise the egg. It is on this technique that all those who now work in this field depend.

2. Successful In-vitro Fertilization of Mammalian Eggs

The ability to fertilise the mammalian egg in-vitro brought closer the technique of in-vitro fertilisation. The embryo were transferred, in some of the cases, into recipient mothers and pregnancy resulted. The following pioneered in this research:

<table>
<thead>
<tr>
<th>Year</th>
<th>Researcher(s)</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>1959</td>
<td>Chang</td>
<td>Rabbit</td>
</tr>
<tr>
<td>1963</td>
<td>Yanagimachi &amp; Chang</td>
<td>Golden Hamster</td>
</tr>
<tr>
<td>1968</td>
<td>Whittingham</td>
<td>Mouse</td>
</tr>
<tr>
<td>1968</td>
<td>Toyoda &amp; Chang</td>
<td>Rat</td>
</tr>
<tr>
<td>1969</td>
<td>Bregulla</td>
<td>Rat</td>
</tr>
<tr>
<td>1982</td>
<td>Abisogun &amp; Ashiru</td>
<td>Rat</td>
</tr>
<tr>
<td>1970</td>
<td>Hammer et al</td>
<td>Cat</td>
</tr>
<tr>
<td>1972</td>
<td>Yanagimachi</td>
<td>Guinea Pig</td>
</tr>
<tr>
<td>1970</td>
<td>Harms &amp; Smidt</td>
<td>Pig</td>
</tr>
<tr>
<td>1969</td>
<td>Edwards, Bavister</td>
<td>Human</td>
</tr>
<tr>
<td>1973</td>
<td>Gould et al</td>
<td>Squirrel Monkey  (Saimiri Sciureus)</td>
</tr>
<tr>
<td>1978</td>
<td>Brackett et al</td>
<td>Cow</td>
</tr>
<tr>
<td>1976</td>
<td>Edwards &amp; Steptoe</td>
<td>Human (ECTOPIC GESTATION)</td>
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</tbody>
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3. Birth From Embryo Transfer

The transferred fertilised oocyte or the embryo led to pregnancy and birth in some cases. This phenomenon has revolutionised the state of art in reproductive endocrinology. The following pioneered in this research:

**Birth From Re-implantation Of Embryo**

<table>
<thead>
<tr>
<th>Year</th>
<th>Researcher(s)</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>1959</td>
<td>Chang, Edwards, &amp; Bavister</td>
<td>Rabbit</td>
</tr>
<tr>
<td>1968</td>
<td>Whittingham</td>
<td>Mice</td>
</tr>
<tr>
<td>1972</td>
<td>Mukherjee, Cohen &amp; Edwards</td>
<td>Rat</td>
</tr>
<tr>
<td>1974</td>
<td>Toyoda &amp; Chang</td>
<td>Cow</td>
</tr>
<tr>
<td>1982</td>
<td>Abisogun &amp; Ashiru</td>
<td>Rat</td>
</tr>
<tr>
<td>1978</td>
<td>Edwards &amp; Steptoe</td>
<td>Human</td>
</tr>
<tr>
<td>1980</td>
<td>Lopata &amp; Johnson</td>
<td>Human</td>
</tr>
<tr>
<td>1982/83</td>
<td>Trouson, Nevada, Norfolk (Fertility)</td>
<td>Human</td>
</tr>
<tr>
<td>1989</td>
<td>Ashiru &amp; Giwa-Osagie</td>
<td>Human</td>
</tr>
<tr>
<td>1982</td>
<td>Brackett</td>
<td>Cow</td>
</tr>
<tr>
<td>1984</td>
<td>Bavister</td>
<td>Rhesus Monkey</td>
</tr>
</tbody>
</table>

Today this technique is now under several rapid research procedures and protocols. Changes are being made by the week and improvements occur affecting the success of the results. In 1979 the success rate recorded for IVF was 15 per cent pregnancy rate and 2 per cent birth rate. Today the pregnancy rate is 35 - 40 per cent while the birth rate is 10-20 per cent.
The IVF Procedure

The patients are selected and monitored from the gynecology clinic. They are counselled by the gynecologist and the endocrinologist. The whole process involves the doctors and the husband and wife.

Superovulation: During the treatment cycle, drugs (hormones) such as clomid, pergonal, and hCG (profasi) or suprefact, pergonal metrodin and hCG are utilised to cause the programmed and controlled production of many follicles (early eggs). This is termed superovulation.

Oocyte Recovery: On the 13th day or thereabout, the patient is taken to the theatre and the follicles are aspirated through laparoscopy or in some centre ultrasound guided oocyte recovery.

Media Preparation: The media used for this culture is Hams F10. The preparation has to be meticulous and accurate. There lies one of the most critical steps, in the technique.

Oocyte Stereomicroscopy: The follicles are then taken to the laboratory for identification and culture for some hours.

Sperm Capacitation: The sperm is washed and capacitated by the media which contains the mother’s serum. This is to make the sperm able to fertilise the eggs on direct contact; a situation that would have been impossible before 1959.

Insemination: The oocyte is now inseminated with drops of the sperm to make sure that about 500,000 are present in the culture. The system is then allowed to mature for 24 hours.

Embryo Microdissection: 24 hours after, the fertilised egg is further dissected from the surrounding cumulus to allow for rapid growth and division.

Embryo Transfer: 24 hours later, the embryo usually from 4-8-cell stage at this time, is now picked up and transferred into the patient's uterus in the theatre. This procedure requires no anaesthesia. Usually 3-4 embryos are transferred in our program.

Patient Monitor and Follow-Up: The patient from this stage is now monitored in the ward with some supportive hormones like progesterone or its different derivatives. Serial blood samples are then taken to measure beta hCG.

Some of the patients are lost to follow-up. Some are discharged still pregnant and miscarry at home. One patient was attacked by armed robbers in her 8th week of pregnancy in Akure and lost the pregnancy. Sometimes we are lucky as in Mrs Oni's case and the baby is delivered.

Further Horizons in Extra-Corporeal Fertilisation

Many works are going on around the globe to improve the success of IVF especially to reduce the rejection factor. As more knowledge of the precise anatomy of conception is understood the success of IVF-ET will become greater. The speed is such that the IVF-ET scientists now know that exchange of ideas must continue constantly between centres at least on a quarterly basis. A lot of support is needed in this area.

Sperm Capacitation and Motility:

The technique, apart from its use in IVF, has provided great results in patients with:

(a) Cervical hostility,
(b) Oligospermia, and
(c) Asthenospermia.
Because we are able to process the sperm through washing and capacitation in the media containing the recipient serum, we can inseminate directly into the uterus and as far as the tubal cornu. The result of pregnancy from this set-up with the husband's sperm is very encouraging. We reported a pregnancy rate of 60 per cent in the series. The data showed that capacitation improves sperm motility even though the cone is decreased.

Studies on Environmental/Toxicology

During the past decade, I have encouraged some of my associates to work on some environmental factors. They include:

(a) MSG: Mono-Sodium Glutamate as in Magi cubes,
(b) Chloroquine, and
(c) Aspirin.

From the published data so far, it can be said that MSG has no adverse effect on adults. In fact, the effect is to delay the onset on puberty.

Chloroquine deserves a close attention and this is still being studied vigorously. It appears that it might have effect on the process of ovulation and spermatogenesis if it is administered in high doses. The effect on the male sperm is probably to cause a reduction in testicular weight.

Aspirin is a drug that is used as anti-inflammatory and analgesic therapy. This drug may prove useful during the early stages of pregnancy while it may become dangerous at the later stage.

What is for the Future?

My areas of interest are the following:

(a) Micro Injection of the Sperm Into the Oocyte

This technique is being developed in some IVF centres. I have an invitation to join in a multidisciplinary centre in Finland on this technique once sponsorship is available.

(b) Donor Carriage System

We have been in the process experimenting on the possibility of donor oocyte being carried by an individual who has no egg production capability. There is a great future on this.

(c) Anti-sperm Antibodies/Anti-oocyte Production

Process of birth control. This will be useful in depopulation activities.

Justification for Advanced Research

What is the need for all this knowledge about the human body either at macroscopic, or at the molecular level? Or some may ask, what is the need for exoteric research?

Let me answer this, first by a famous quotation by Booker T. Washington:

"No race can prosper till it learns that there is as much dignity in tilling a field as in writing a poem."

With regards to science, it is very clear that knowledge is power and wealth, and it confers independence and freedom. The knowledge of an individual would affect that of the people around him and eventually the nation. In the United
States of America, it is recognised that GNP is proportional to the rate of advancement in medicine. It is no surprise therefore that 5 per cent of their budget is devoted to health, and health research takes a sizeable proportion of this allocation. Imagine the amount of work output lost daily due to sick-leave in Nigeria; or indeed the mortality rate of infants and premature (life span) of adults.

For Nigeria, if we are to be part of the developing world striving towards becoming a developed nation, we must operate like the other Third World countries that are becoming newly developed; countries like Brazil, Korea, Singapore, and many others. We must make efforts in all spheres of life towards development lest we become the Fourth World. Happily, I must say at least for anatomy, we are moving in the positive direction. In recognition of the research work coming from Nigeria in anatomy, the executive council of the International Symposium on Morphological Sciences meeting in Nancy, France, in August 1990 unanimously elected me as the 18th member of the council. This is the first African representative on this 50-year old council.

It is very pertinent to emphasize that no matter how remote it might be every research would eventually be to the benefit of somebody, and that makes the whole exercise worthwhile.

The above is a rather elaborate picture of the anatomist in the role of healing from the early period till today and includes my widow's mite to the crusade of improving the health of the people; the motive behind this search for knowledge and the desire to alleviate suffering of the ill person. It is a continuous battle and one should never give up. Sir Thomas Brown, a 17th century Norwich physician said:

"We all labour against our own cure. For death is the greatest cure of all deseases. But to the afflicted, even the greatest disease is better than the utmost cure"

However, today, the management of, for example, ectopic pregnancy with the previous removal of the ovaries to prevent future tumor is now obsolete. Such women can now have their babies.

Mr. Vice-Chancellor Sir, distinguished ladies and gentlemen, permit me to comment briefly on one issue that disturbs me very much.

I believe that the inaugural lecture is one of the ways by which the university fulfills its obligations to society. I therefore seek coverage under academic freedom while I seize this opportunity to make my comments. This is in connection with the state of art in Nigerian universities.

**Infrastructure and Staffing**

It is now clear that while every effort is being made to develop some aspects of the university system for instance in manpower development, the rate of depletion of the trained academics can no longer meet the rate of training. Please examine this scenario in the light of the following:

(a) Professors who have reached the age of 60, very active and full of energy of rare grey cells are made to retire even though they are not tired. Some of them are not yet 60 years old but they have spent 35 years in service;

(b) The research project and the clinical specialty of some of these professors die quietly in the university system, so does the training of doctors at post-graduate level become more difficult;

(c) The doctors who receive training are given lucrative jobs outside the country or made to shoulder greater responsibilities in new universities; and

(d) More universities are being created thereby further increasing the staff demand.
The implication of these are obvious. These lead to very few staff who are under-trained and over-worked. To crown it, these staff are given ridiculous salaries and very poor incentives, when compared to what obtains in other developing countries. Hence the brain drain. Additionally there is constant harassment and instability based on what obtains in the country at large. You find there is reverse reward for hard work and excellence. Money is now in the hands of those who display uncontrolled ostentatious spending.

Take anatomy for example, there are few very qualified anatomists in this country today. Only a few medical schools can boast of being able to meet the NUC criteria or even the NMC criteria on staffing. Since anatomy is the foundation necessary for good medical training, if standard must not be compromised, the so-called "Health for All by the Year 2000" may become an illusion. Although there is an attempt to justify this through primary care, which is important, the corollary to primary care is good secondary and tertiary care, universal primary education means advancement of secondary and tertiary education for effectiveness.

Apart from these, the morale of the doctors have been bruised for years. Many people always talk of those years when Sir Samuel Manuwa as the Inspector General of Health Services in Nigeria acted as the Governor-General when the incumbent was on leave. Today, we are told that no doctor is reflected on the honours award or the State House protocol list.

Lastly, the monthly salary of many professors in Nigeria today is about $200.00 while the average salary of their counterparts in other parts of the world and where some of our doctors are now working is $6,000.00 - $10,000.00 per month. I believe this country is meant for all of us and we must do everything to make it a great nation. When Britain had a brain drain of its doctors, they increased the salary and allowances and the doctors drained back to Britain. Some of the positions they vacated in the Middle East countries and America are now being filled by Nigerians. Right now, in the scheme of events, money - and how much of it you have - has staged a perfect coup on intellectuals. In the end, if care is not taken, our health system, our educational system and many others would collapse. What our forefathers have taken great pain to build may become a desolate waste.

Student Population: The Training and the Infrastructure

The future of this country lies in the students of today and tomorrow. I believe they must be exposed to an ideal training. This must not be the sound academic knowledge alone. The living environment is a major factor in enhancing students learning. Therefore the hostel environment, social, sport and library facilities should always be at the optimum service level. There is need now for computer facilities for literature review in our libraries for patient records and therefore writing a review case study. It is important to expose these students to the best so that they would know how to give the best in future; and be able to function and compete with their counterparts in other parts of the world.

I like to propose the following solutions. I already made some of these submissions to the National Committee on Brain Drain:

(1) The establishment of new universities either state or Federal in this period, is a colossal waste of fund and resources. Older ones should be expanded to accommodate more students - I can illustrate this.

(2) The adequate remuneration of medical staff is a necessity. Some of the examples given are adequate justification. This remuneration can be done by many procedures and it can be worked out easily if the government is willing. One such example is the much celebrated intra-mural private practice. Let me give the example of Iraq at least the Iraq before August 2nd, 1990 (that is Iraq without annexation of Kuwait). The Dental School opens the dental clinic for outpatient from 9.00 a.m. - 2.00 p.m. The treatment at this time is for all and sundry at government subsidised rates. The same clinic opens from 4.00 7.00 p.m. to private patients. All billings are computerised. The consultant teaches students for
longer period, the rich private patients make money available for materials for them and the excess is utilised to treat the non-private patients the next day. Consequently, the set-up is always functioning with little government support and everyone is happy.

In short the remuneration in the university must be competitive.

(3) Professors cannot be made to retire at 60 years of age just like that. Especially if they are active, I believe 65 years or 70 years may be the starting point. In Nebraska, the Professor Chairman of the Anatomy Department who invited me to Nebraska in 1977 is still very much active as chairman. He will retire in 1991 at the age of 72, and he will serve as Emeritus Professor thereafter. Professor Holyoke his predecessor will then bow out as Emeritus Professor at Large, at the age of 90 years. They provide invaluable leadership, experience, quality control in terms of research and teaching. This is practised in many countries. There they can even boast of more staff than we have. What then is our hurry to retire these people?

(4) The dignity of the medical profession and the academic needs to be uplifted. We should borrow a leaf from the past and restore the glory of the profession back to them. That is the case in most developed countries. Money talks; only a comfortable person can be listened to; a poor man is not a happy man.

(5) There should be merit award for excellence in research and in good teaching.

(6) Superlative achievements in medical service to the nation deserves National Honours Award.

(7) University professors and academicians should exercise a lot of restraints when being called upon to take up appointment as Vice-Chancellors, Rectors, or Provosts of new academic institutions unless and I repeat, unless there is absolute guarantee that money is available to implement such projects. We know of institutions abroad which started with up to $20 million as capital expenditure. You don't just open a bank unless you have some good deposit in the Central Bank to ensure smooth operation. This should apply to the universities.

I can go on and on but the final solution to our Nigerian problem is that every Nigerian wherever we are and in what capacity we function, we should think of doing good in that position, we should do the best for ourselves and our neighbours and the country at large. This is aptly put by Beethoven (1703) when he said:

"I recognize no superiority in mankind other than goodness."

The second testimony to doing good is that by so doing we are actually serving God the Almighty. The reward is eternal and better than the temporary ones of high offices. Even in the high positions one should have God in mind. This again is well illustrated in a quotation that my father likes to quote. I knew it even before I was in high school. It is by Shakespeare, who said:

"Had I but served my God with half the zeal
I served my king, he would not in mine age
Have left me naked to mine enemies."

- Shakespeare, Henry VIII
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I would now like to end by encouraging our great nation to aspire to high heights in greatness in all spheres of life. We have to do this for this nation in all our chosen fields. This can be seen in the words of Olsen Welss, a famous film producer and director who in his narration of a film titled The Man Who Saw Tomorrow, referring to the predictions of Nostradamus, a 16th century physician who predicted that there would be a Third World War in 1994 and said:

"We can change this event for good if we think of doing things - good things - not for ourselves, or for our children, but for our children's children."

I recommend this quotation to all.

I thank you all for your presence and attention.