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PORT HARCOURT

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Titled

… AND THERE WAS LIGHT: A PHOTOCHEMIST'S ACADEMIC JOURNEY

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SERIES NO. 4

DEDICATION

TO MY DEAR PARENTS, WIFE AND CHILDREN

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PROTOCOL

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The Deputy Vice Chancellor (Administration), Prof. Victor A. Akujuru
The Deputy Vice Chancellor (Academic), Prof. Valentine B. Omubo-Pepple
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Emeriti Professors
Heads of Campuses
Distinguished Professors and Members of Senate
Heads of Departments and Units
My Lords, Spiritual and Temporal
Royal Majesties and Highnesses
Distinguished Guests
Staff and Students of RSU
Ladies and Gentlemen

1. INTRODUCTION

The Beginning

The beginning is a good place if you are not sure where to start. So, I was born the first of eight children to Mr. Francis and Mrs. Hannah Fekarurhobo, both primary school teachers at Oginibo, Ugheli South Local Government Area of Delta State some 70 years ago. Both parents left Nigeria to the United Kingdom when I was in the first year of secondary school and it may be imagined that in my formative teenage years, my behaviour was largely left unchecked by the usual parental scrutiny. It was the grace of God, the fear of my Principal (Late Pa. D.D.T. George, from Buguma) and my paternal uncle (Late Pa. S. O. Pela) that whipped me into some semblance of conformity with expected teenage behavior. My laissez-faire life was cut short when my father came back to Nigeria to take my siblings and I to London in March 1970, after the civil war. Given the high degree of freedom that is accorded to children in the U.K, I took to life in London like a duck to water and that led to my getting on with my parents like a house on fire. The whip was relaxed on me when I passed all of my ordinary and advanced level subjects to enable my admission into university. Not only was I the first black boy to enter directly into university from William Penn Comprehensive School, it was the University of London and to read Chemistry! Even my white contemporaries admired my courage in enrolling for a degree in the revered subject! Never an adherent of the stoic philosophy, the little efforts I invested in my studies yielded great dividends and I graduated one year after my dad graduated from the University of Sussex. I

immediately enrolled at Birkbeck College, University of London, where I obtained a PhD degree in Chemistry and was thereafter employed by my supervisor as a Postdoctoral Research Officer for two years before returning to Nigeria. My gratitude goes to my supervisor, Dr. Howard Carless, a twelve-apostle photochemist, for introducing me to the new area of specialization with its ample research opportunities.

How I Was Employed at RSU

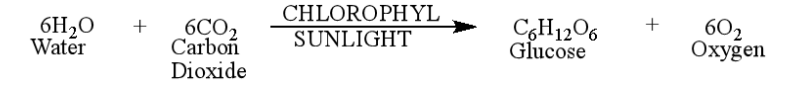
My NYSC ended in 1986 and my stay in Nigeria was challenged by unemployment in the midst of the austerity measures in the Nigerian economy at that time, enacted by the Buhari/Idiagbon military regime. Surely, it was time to return to London … but no, as the hardship was cushioned by friends who filled in my lacks and encouraged me to hang on. I applied to several universities and companies for employment and attended several interviews but the Head of Department of Chemistry, RSU at the time, went out of her way to facilitate my employment in August 1986. Vice Chancellor, sir, please permit me to give credit to Professor Faithwin Obomanu and her husband, Amaopusenibo Gam Obamanu, for seeing any potential in me that was worth sticking out their necks for.

And so, I arrived in Port Harcourt, the much-heard-of City of goodlife, with a suitcase filled with the latest designer wears in the flatboot of the latest model of Mercedes car. I was the "new boy on the block". On reflection, it was the grace of God that saved me from falling into bad company, although as Casanova put it in his memoires, the reader would have been permitted to

wonder what the company fell into. With many contributions from colleagues, students, family and friends, I rose through the academic ranks and was considered worthy of recommendation for promotion to the rank of Professor of Organic Photochemistry. However, the assessors came back with reports suggesting that I was qualified to be professor in both Photochemistry and Organic Chemistry and that I be promoted and designated Professor of Photo- and Organic Chemistry in the year 2006. Thus, I became a double professor!

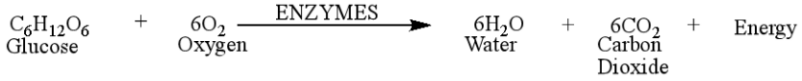
2. THE LECTURE TITLE

I gave my inaugural lecture in 2014, being the 30th in the series (Fekarurhobo, 2014). The lecture was titled "**Let There Be Light: Photochemistry In Action**." Vice Chancellor, sir, with feelings of happiness at my achievements and the challenges surmounted, mixed with sadness that I will be leaving the academic life, today I stand at the lectern before this august gathering in the Senate Chamber of the Dr. Nyesom Ezenwo Wike Senate Building to deliver my valedictory lecture. In the beginning, I prayed for the light to illuminate my path and today I stand here to testify that my prayer was answered…… **and there was Light!** The Holy Bible records that light was the first thing that was created when God said, "Let there be light" (Genesis 1:3). The first chemical reaction in nature was Photosynthesis– a photochemical reaction that may be summarized as in Scheme 1.



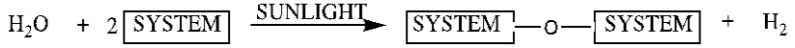
Scheme 1: Photosynthesis

Shorn of the details of the reaction, essentially, water is split into its components of hydrogen (H) and oxygen (O) and the former is incorporated with carbon dioxide (CO_2) into glucose ($C_6H_{12}0_6$). While the released oxygen is considered by many to be a side product, I think many are wrong because a reversal of the photosynthetic process sustains life. Here, glucose and oxygen combine in living cells to produce carbon dioxide, water and energy in a process known as RESPIRATION- an essential characteristic of living things (see Scheme 2).



Scheme 2: Respiration

I often employ this short expose of photosynthesis to stimulate the interest of the students in the final-year introductory Photochemistry course because there is a hidden treasure in the reaction; if a similar process is invented that uses the abundant natural sunlight to split water into oxygen and hydrogen but unlike photosynthesis, binds up the oxygen and releases hydrogen, much money can be generated from it, as represented in Scheme 3.



Scheme 3: Photolysis of Water to Produce Hydrogen

The released hydrogen can be used to fuel internal combustion engines (e.g. vehicles). VC, sir, such a system would solve both the world energy and environmental pollution problems because natural sunlight would be used to produce hydrogen, which burns in air to give water and heat energy only, as represented in Scheme 4.

$$2H_2 + O_2 \xrightarrow{\text{SPARK}} 2H_2O + \text{Energy}$$

Scheme 4: Combustion of Hydrogen Gas in Air

Development of such systems has reached advanced stages (Tran et al, 2024).

The Invisible Light

The Holy Bible says, "In Him was life; and the life was the LIGHT of men" (capitals mine, John 1:4). This leads to the inference that apart from the visible light that illuminates and guides physically, there is also the invisible inner light that guides in the resolution of alternative decisions. Vice Chancellor, sir, looking back at my life and my modest achievements, I thank God that my prayers were answered…. and there was Light.

Why Chemistry?

As a young boy newly introduced to the study of Science, I was fascinated by laboratory experiments that formed new substances, some of which already existed in nature. For example, the bubbling of carbon dioxide gas into an aqueous solution of calcium hydroxide to form a solid was magic to me,

as I did not know the explanation for the reaction that may be represented as in Scheme 5.

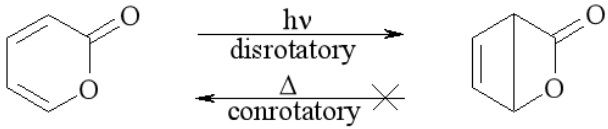
Scheme 5: Formation of Insoluble Chalk from Calcium Hydroxide Solution

In the light of understanding illuminated by knowledge, the darkness of bewilderment was replaced by keenness, to use a gross meiosis. Chemistry became my best subject in secondary school. In university, I developed an inclination towards one of its three branches known as Organic Chemistry which may be loosely described as the study of covalently bonded carbon compounds.

Why Photochemistry?

When it was time to decide what aspect of Organic Chemistry to specialize in at the postgraduate level, I opted for something out of the usual. In most of Organic Chemistry, heat is applied if the mixture does not react at room temperature. In photochemistry, light (sunlight or artificial) is used to cause chemical reactions even at temperatures as cold as -80^{o}C. Thus, when I was perplexed as to the choice of specialization in postgraduate studies, I prayed…. **and there was light!** In my decision making, I considered the possibilities of harnessing the abundant African sunlight in producing things of commercial value. I also took into consideration the wasteful nature of further depleting the already dwindling availability of fossil fuel in the production of anything in a scale large enough to be commercially viable. The environmental pollution effects of burning fossil fuel also influenced my decision.

The fundamental relevance of light to life is evidenced in the biblical history of creation. Light was the first thing that was created when God commanded "Let there be Light". It is no wonder then that photochemical reactions are ubiquitous in nature. Besides that, there are several compounds whose highly strained structures preclude their synthesis by thermal methods, but they can be accessed by photochemical routes as exemplified in Scheme 6.



Scheme 6: Formation of a Thermally Stable Strained Compound by Photocyclization

In spite of the primordial existence of photochemistry in nature, the early photochemists who presented their findings were ridiculed for bringing "spiritual matters" into serious scientific gatherings, as neither they nor their contemporaries could explain how organic compounds could form by exposing their precursors to sunlight. As I always relate this story in my first lectures with the final-year Photochemistry classes, the students have dubbed the course title "**spiritual chemistry**".

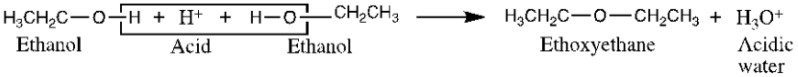
3. TEACHING

At the beginning of my teaching career at RSU, I observed that students expected to learn organic chemistry by rote, memorizing without knowing the underlying explanations to the reactions. Applying this method to teach organic chemistry results in the acquisition of a catalogue of unrelated knowledge. That was at variance with how I was taught the subject and

contrary to scientific evolution, which seeks to propound a universal theory that explains all observations. To improve the students' understanding, I introduced the concept of reaction mechanisms into the teaching of my Organic Chemistry courses using the retrosynthesis method (see Figure 2).

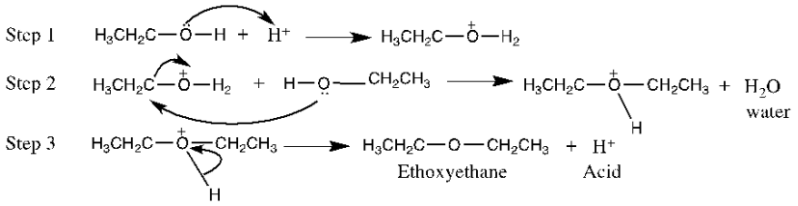
I also introduced the teaching of Organic Chemistry by interactive tutorials instead of the usual pedagogical method. Thus, I would introduce a chemical reaction, explained how it occurred (i.e. its mechanism), gave examples and asked students to volunteer to come to the board and solve further examples. If no one volunteered, I would have them take turns to come to the board. If a student could not answer at the board, I would take them through the explanations again while the many others who might also not have understood would benefit from the mistakes of the one at the board. The following examples in Scheme 7 and Scheme 8 will serve to illustrate the difference between the two methods of teaching Organic Chemistry:

PEDAGOGICAL METHOD



Scheme 7: Pedagogical Representation of Ethoxyethane Formation

MECHANISTIC EPLANATION



Scheme 8: Mechanism of Ethoxyethane Formation from Ethanol

The reaction in the pedagogical Scheme 7 may be simplified into the colour representations in Figure 1:

PEDAGOGICAL

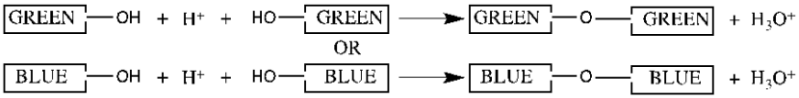
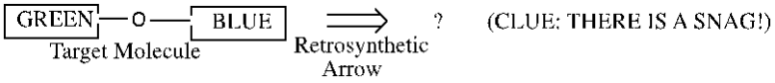


Figure 1: Colour Representation of Alkoxyalkanes Formation from Alkanols

A typical question and answer that could arise from the pedagogical presentation of the reaction in Figure 1 are shown in Figure 2.

Question: How can the following target molecule be synthesized ?:



Typical Answer:

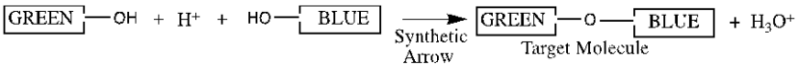


Figure 2: Question and Answer on Formation of An Alkoxyalkane from Alkanols

The snag: Students who understood the mechanistic explanation would know that in the reaction, alkanol could react with alkanol, thus all possible permutation products would form as represented in Figure 3.

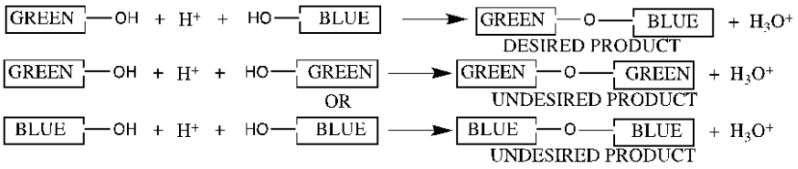


Figure 3: Formation of Desired and Undesired Alkoxyalkanes from Reactions of Alkanols

The ratio of desired to undesired products is 1 to 2, representing a theoretical yield of 33%, therefore the method is unsuitable for the preparation of alkoxyalkanes (i.e. ethers) of mixed colours! By stating the problem, the students are primed to receive the solution as in Figure 4.

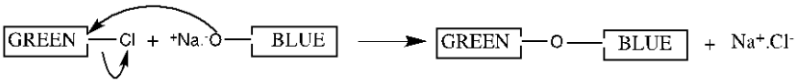


Figure 4: Colour Representation of the Williamson Alkoxyalkane Synthesis

Unlike the reactions in Figure 3 where one alkanol can attack any alkanol (including itself), in this reaction, only the blue alkoxy molecule can do the attacking indicated by the curved arrow and the method, named after its discoverer, is known as the **Williamson Alkoxyalkane (or Ether) Synthesis**. The method cannot form any of the undesired products.

I take time to explain to the students that the intention of asking them to come to the board is not to embarrass them but that it is a way of ascertaining that each of them is conversant with the subject matter as I desire them to be, as reflected in the following quote:
"Treat people as if they were what they ought to be and you help them to become what they are capable of being."

…….Johann Wolfgang von Goethe

When students are reluctant to come to the board, I explain to them that coming to the board to answer questions exposes their ignorance and that their tuition fees are used to pay me to remove it, but this can happen only after it has been identified. I liken hiding their ignorance to someone who pays for garri but leaves it behind in the market! Many students have benefitted from the tutorial approach to teaching Organic Chemistry.

Figure 5: Professor Leslie Hough

In my undergraduate university courses, the most senior lecturers were assigned to teach their specialist areas to Year 1 students. Thus, I preferred to teach years I and II Organic Chemistry courses, to lay a solid foundation in the discipline. For instance, in my Year 1 Organic Chemistry course, I was taught Carbohydrate Chemistry by Professor Leslie Hough (see Figure 5), whose name was synonymous with the sugar company, Tate and Lyle because of the research funds he was getting from them. His affluence was exemplified by the aroma of his pipe tobacco, which preceded his entrance into the lecture

hall by about 2 minutes! Influenced by his flamboyance, on assuming my lectures at RSU, I also smoked a pipe into the lecture halls, but this had negative consequences, as some students stopped attending! I had to send messages to them that I had stopped the habit before they resumed attendance at my lectures.

Photochemistry was introduced as a standalone course a few years after I started teaching at RSU. The course content was drawn up by me and other universities copied our example when the course later became essential to the now fashionable Green Chemistry, which advocates the novel view that chemical reactions should be carried out with minimal impact on the environment. Thus, when Dr. Sergeant Bull went to study for a Master of Science degree in Green Chemistry at Imperial College (University of London), I sent a text to him to enquire about the course content and he replied that it was all photochemistry! He was appreciative that his knowledge of the undergraduate Photochemistry obtained from RSU was instrumental to his understanding of the postgraduate courses in Green Chemistry.

Vice Chancellor, sir, when I began conducting undergraduate laboratory classes at RSU in
1986, I observed that the experimental procedures used were relatively large-scale and that involved large quantities of reagents. As the years went by, the number of students increased, reagents costs skyrocketed and given the SAPped(!) national economy at that time, the available funds became insufficient to provide for the bucket-scale experimental procedures. Faced with the alternatives of either increasing the number of students in a group or reducing the number of experiments, my colleagues and I took up the challenge and came up with a solution(!). We published a laboratory manual containing test-tube scale experimental procedures that demonstrated the same Organic Chemistry principles as the

large-scale did (Fekarurhobo *et al,* 1998). In the manual, experiments are organized into groups of related topics, each with theoretical explanations (with mechanisms of reaction) that account for what is to be observed in the procedures. Questions followed each of the procedures to test the students' observations and their ability to relate them to the preceding theoretical introductions to the experiments. Scaling down the quantities of reagents saved costs and enabled more students to have hands-on experience during the laboratory classes, contrary to what obtained with the old procedures, where the large group sizes conferred on many participants the status of onlookers.

I started teaching Organic Chemistry at RSU at a time when the national economy restricted the purchase of textbooks in the subject area to the very few students who could afford them, as most of the recommendable ones were written by foreign authors and published in foreign countries. Once again, Professor Faithwin Obomanu and I took up the gauntlet and published a textbook of Organic Chemistry that assumed the readers had only a fundamental Secondary School Certificate knowledge of the subject (Fekarurhobo and Obomanu, 2000). Of course, in the book, mechanisms are used to explain the reactions in order to ensure a better understanding and ability to apply the concepts introduced. The book is not only recommendable to undergraduates but also to postgraduate students who desire to gain a mastery of the subject area. It is the Organic Chemistry textbook of choice in RSU and in many other Nigerian universities where protectionism has not hindered its recommendation to the students.

Teaching Observations

a. Low Standard of English Language

Over the years of teaching Chemistry at RSU, I have observed some areas that need improvements. One of these is that I often found myself teaching both Chemistry and English Language in

the lectures. The standard of English Language at both undergraduate and postgraduate levels needs to be upgraded by encouraging students to read newspaper and magazine articles, especially those related to their subject matters. They should also be given more opportunities to write essays and to make presentations at tutorials.

b. Decaying Academic Standards

It is my observation that standards have been gradually reducing over the years since 1986, when I began teaching at RSU. The cold comfort is that the degradation is national and is not restricted to RSU. I am sure that I am not alone in noticing this. It is my opinion that the origin of the decay is in our secondary schools. My first-year undergraduate students freely confess that they were taught little or no Organic Chemistry in their secondary schools. Their teachers often left it until close to the external examinations, only to make excuses that there was no time to teach it, asking the students to read it up themselves. The consequence of this lapse is that I find myself teaching School Certificate Organic Chemistry before going on to the Year I university course contents. The effect is that I have to teach the Year I carry-over contents in the Year II courses, if the students' understanding is to remain the primary objective. The outcome is that some course contents are left uncovered into the final graduation year. The domino effect is that this is carried over to the graduates and eventually onto the quality of lecturers employed in the universities to teach the subject. Thus, it is a vicious circle and the steady decline has been observable over the years.

To worsen matters, this decline in teaching standards is occurring nationally at a time when world standards are rising. I recently observed that the same Chemistry course contents used in my Year I at the University of London are now incorporated into the Advanced Level GCE Syllabus.

c. Populism

The rising trend of lowering standards in order to become more popular has infiltrated into academic life and this has also contributed to the lowering of standards in universities. Thus, lecturers are no longer rated by the efficiency of their teaching but by their leniency in awarding grades. Similarly, universities are rated more by the number of first-class graduates produced than by their quality. While I sympathize with the fox, I also understand the point of view of the hound and I can see the dilemma of the universities. To paraphrase a character in one of Woody Allen's comedies, "My brother is insane. He thinks he is a chicken, but I don't want to consign him to the asylum because I need the eggs that he lays".

4. RESEARCH, PUBLICATIONS AND COLLABORATIONS

Research and Publications

In my Chemistry research at the University of London, I was fortunate to have had a photoreactor available for my reactions. In the absence of the equipment at Rivers State University of Science and Technology, I had to improvise with natural sunlight and a high-watt photoflood lamp (Plate 1).

Plate 1: Improvised Photoreactor

Vice Chancellor, sir, I am happy to report that the commercial photoreactor (Plate 2), which you recently approved for purchase, is now installed in the Department of Chemistry and to my knowledge, it is the only one available in Nigeria. The students and I are very excited(!) about the possibilities that its usage promises.

Plate 2: Commercial Photoreactor

However, the dearth of equipment did not decrease my zeal for research as much as the material and academic advantages I came back from abroad with. There I was, a young unmarried man, driving the latest model of Mercedez Benz car (of which there were only 3 on campus) and a Lecturer II having 6 publications in UK-based scientific journals at a time when 7 to 10 of such articles were enough for promotion to the rank of Professor. The publication of more journal articles would have resulted in my having more papers than my superiors and that would have earned me the description of "arrogant" (in spite of my humility); that would not have augured well for me at a time

when one could publish and still perish!

In a meeting in 1989, I was being appraised for promotion from Lecturer II to Lecturer I, when a member of the Senate panel observed that I had more journal publications than those being considered for promotion to the rank of Senior Lecturer and he suggested that I be promoted to that rank. A hot debate ensued and it was finally agreed that I be regraded to Lecturer 1 with effect from 1986, when I was first appointed, so that I could be promoted Senior Lecturer at the next opportunity. Thus, in 1989 I was regraded Lecturer I with effect from September 1986 and subsequently promoted Senior Lecturer in September, 1989. The arrears of salary difference from September 1986 to May 1989 were also paid!

The accelerated promotion restored my faith in the system and encouraged me to pursue research assiduously. I have aroused the interest of several of my colleagues, undergraduates and postgraduate students in photochemistry. Among the colleagues are Late Professor W.A.L Izonfuo, Professor F. G. Obomanu (an alumnus of the University of London), Professor I. F. Oruambo, Professor J. Otaigbe (UNIPORT) and Dr. G. I. Ndukwe, while the postgraduate students include Prof. S. S. Angaye, Professor N. Boisa, Dr. J. Maduelosi, Dr. N. W. Asimiea, Dr. F. Daniel and most recently Dr. C. Enyi, Yerebabari Nwidag and Tochukwu Anslem. Although we initially suffered several unfavourable peer reviews, our articles became more acceptable with the advent of the fashionable Green Chemistry, in which one of the tenets is the conservation of energy resources by increasing the use of natural sunlight. We have published several articles in highbrow journals.

Collaborations

Our collaborative research projects include the following:

- Photoxidation of alkenes and alkadienes

- Photodegradation of natural rubber latex
- Photodegradation of crude oil
- Photostability of a dye from zobo extract that can be used as an indicator in acid-base titrations
- Photolarvicidal activities of zobo extract
- Photodegradation of edible vegetable oils on exposure to sunlight
- Replacement of synthesized commercial dyes with natural dyes isolated from plant materials for use as sensitizers in photoxidative synthesis of fine chemicals

Especially worthy of mention here is our collaborative research with universities outside Nigeria. Vice Chancellor, sir, we are grateful for your kind approval and financial assistance to enable Dr. C. Enyi to become the first co-tutele student to be awarded a joint PhD degree in the history of Rivers State University. The degree was jointly awarded by Rivers State University (RSU) and James Cook University (JCU), Australia, after experimental work and rigorous external examinations severally at both universities. The work was supervised by Prof. G. K. Fekarurhobo and Dr. G. I. Ndukwe of RSU, and Prof. M. Oelgemoeller, a photochemist at JCU, Australia. We acknowledge the inputs of Prof. T. K. S. Abam, the erstwhile Director, Advancement/Linkages Centre and his team, for the hard work they put in to achieve the signing of the co-tutele agreement between the two universities.

Sequel to the success of RSU's collaboration with JCU, another of our PhD student, Rachael Ekong, is currently at Walter Sisulu University (WSU), South Africa, extending the success she has achieved in the research into the use of a plant (name withheld) extract in cancer therapy. Vice Chancellor, sir, I am excited(!) to report that the results obtained so far are very promising and a patent is underway for the two universities. The research project is being supervised by Prof. G. K. Fekarurhobo and Dr. G. I.

Ndukwe of RSU and Prof. A. O. Oyedeji of WSU, South Africa.

Encouraged by the success of our foreign collaborations, the Postgraduate School Board has recently approved the appointment of Prof. Samuel O. Oluwafemi of University of Johannesburg as co-supervisor of Amarachukwu Oluah, our PhD student working on the use of Plant Phytochemicals in Photodynamic Therapy. Prof. Oluwafemi is a budding Nobel Awardee in this relatively novel application of photochemistry to solve problems in areas ranging from the environment to Medicine. Vice Chancellor, sir, I am happy that the Light that guided me to specialize in an unusual area of Organic Chemistry with few practitioners, is now becoming popular in its applications. Now I know that God did not make a mistake when He made light His first creation.

5. ADMINISTRATION

I held a few administrative appointments in my career at Rivers State University. They ranged from Departmental Course Registration Officer, Head of Department to Dean of Postgraduate School.

Head of Department

I was first appointed Acting Head of Department of Chemistry in 1999, during the Vice Chancellor tenure of Prof. Steven Odiowei, at the time that Bayelsa State was newly created and some of her indigenes were planning to relocate to the new university to be started there. It was 10 years after my promotion to Senior Lecturer in 1989. At that time, Senate meetings were held in a room adjoining the Vice Chancellor's office at the Old Site, no larger than one-sixth of the present venue. At the time, refreshment was not being served at Senate meetings until Late Prof. E. N. Amadi and I, Ag. Heads of Biological Sciences and Department of Chemistry respectively, served suya and drinks at our expense in one of the meetings. Thereafter, the Vice

Chancellor adopted it and approved that refreshment be served in subsequent meetings, the practice of which has been sustained and continually improved on by successive Vice Chancellors.

There was an incident during this tenure that jolted me into realization of the powers of the Head of Department as a direct representative of the Vice Chancellor. In the absence of my Faculty Dean, the Deputy Vice Chancellor and Chairman of the University Admissions Committee, Prof. A. Monsi asked me to make recommendations directly to him, implying that the HODs have the statutory rights to do so.

My second appointment as Head of Department was in February 2011, under the tenure of Prof. B. B. Fakae as Vice Chancellor. The appointment came to me as a bolt out of the blue because I was not invited for consultation prior to it, as was the previous practice. It was a tasking job filled with unlearning of previously held notions and learning of new ones about university practices, many of which ran along the grains of what I was used to in my studies abroad. Standards were calibrated and reset in a bid to establish the tenets of the motto emblazoned on our university crest– Excellence and Creativity. As is usual, the changes were wrongly or rightly resisted and I found myself on the side charged with the responsibility of implementing them. In the process, eggs were broken to make omelettes, toes were stepped on but, in the end, the general realization was that the goals were agreeable to all and that we only differed on the means of achieving them.

Dean of Postgraduate School

During my second tenure as Head of Department, the Dean's position became vacant in the Faculty of Science and my friend, Prof. I.K.E. Ekweozor and I were to stand for election to fill the vacancy. After friendly understandings, he and I resolved that I withdraw for him to be elected to hold the position for the 2-year

duration, thereafter he was to support me in the next election. However, in September 2014 and during the second tenure of my friend as Dean, I was invited by the Vice Chancellor, Prof. B. B. Fakae, to come to the Vice Chancellor's lodge and I had no clue what it was all about. On arrival, in my nervous anxiety, he offered me appointment as the Dean of Postgraduate School. I was not to be blamed for the increase in my nervousness, not only because I was going to become the 4th highest academic official on campus but also because of the awe and nervous respect that the incumbent Dean of Postgraduate School commanded in the university community!

On assuming office after the handover formalities, I noticed piles of admission application forms on the floor. I immediately sorted and sent them to the Faculties for their recommendations. Postgraduate School Board meetings were hurriedly held to recommend qualified applicants to Senate for admission. The Monday morning devotions we held for Postgraduate School staff offered me the opportunity to learn from the staff and to continually refresh our goals in their minds. I repeatedly urged them to treat the Postgraduate students as clients patronizing the school. I not only ran an open-door policy but also an open-air one, where students and staff were free to stop me anywhere, vent their complaints and suggestions and seek clarifications on the school's processes. The friendly disposition that pervaded the Postgraduate School environment recommended it to prospective applicants and this generated an exponential increase in the students' population. Very soon, the Postgraduate School's car park was spilling over in evidence of the success of our approach and support from the Vice Chancellor, Prof. Fakae. I am very sure that the neighbouring institutions who had been poaching students in RSU's catchment area felt the impact of our success in their diminishing postgraduate students' enrolments.

Although I introduced the preliminary examinations of the

dissertations and theses at Departments and Faculties before their External Examinations at Postgraduate School, I must confess that the success we achieved was not so much as a result of new processes that were initiated by me as the quality assurances that the enforcement of the extant ones engendered. These were contained in the Administrative Procedures and Thesis Writing manuals that were written by the Vice Chancellor, Prof. B. B. Fakae and my predecessor, Prof. E. N. Amadi. The implementation of these with a human face brought regularity to the Postgraduate School processes.

While insistence on adherence to the processes and regulations contained in the manuals brought more of sanity than resistance to change in the system, the effect was that I found myself working late into the nights, giving credence to the euphemism that the best way to do things to one's taste is to do them by one's self. The work included corrections of English Language and enforcing adherence to the Postgraduate School formats in the examined write-ups to be submitted to Postgraduate School Board for recommendations to Senate for approval of degree awards. Although, the strife for excellence took its toll on my time, many Postgraduate students who went through the rigorous process acknowledge that their knowledge was improved by it.

My tenure as Dean, Postgraduate School ended after an 18-month stint, when I handed over to Prof. N. S. Okogbule, who has gone from there to become the incumbent Vice Chancellor. I proceeded on sabbatical leave, approved by the Vice Chancellor, Prof. B. Didia. Vice Chancellor, sir, it is regrettable that my retirement now may have robbed you of the opportunity to reciprocate the gesture by handing over to me at the end of your tenure!

I acknowledge the cooperation I enjoyed from the Vice Chancellors, Prof. B. B. Fakae and Prof. B. Didia, Deans of

Faculty, Postgraduate Coordinators, Heads of Department and all Postgraduate School staff, especially Mrs. I. B. Harry and Dr. Gift Eke, Postgraduate Secretary and Accountant, whose hard-work have enabled their preferment to appointments as University Registrar and Bursar respectively.

6. CONSULTANCIES AND GOWN-TO-TOWN

Bringing up children was financially demanding for me and burning the proverbial candle at both ends could not remedy the discrepancies between my needs and resources. As my good friend and benefactor Olorogun Alex Ajuebon put it "so you have decided to burn the candle in the middle too!". He offered me the position of Consultant Chemist in his company, which is one of the best indigenous drilling fluids companies in Nigeria. Olorogun Omoforho, Umogun! Thank you!

I was also fortunate to be involved as Chief Chemist in the first environmental consultancy awarded by OMADEC, led by my friend and colleague, Prof. Ibiba Oruambo. This exposed me to experience in the practice of environmental pollutant assessment- an area outside my specialisation.

7. CONCLUSION

Vice Chancellor, sir, I have traced my academic journey from birth to retirement, taking stock of my experiences, challenges and achievements. Throughout the narrative, I have acknowledged the contributions of the giants whose shoulders I stood on to see what the light was illuminating in my path in life. In the light(!) of my experiences, my presentation has hinted on areas where improvements can engender greater academic productivity for the university. Please permit me to point out a

few of these. My students who in the course of their research have been privileged to work in university laboratories outside the country have returned with glowing references to their abilities, which are disproportionate to what they could have achieved if they had not had these opportunities of better equipment and facilities. In other words, what is eating the kola is inside the kola nut and it is the high density of trees in the forest that confers on the monkey its high agility status. Vice Chancellor, sir, if given a well-equipped laboratory, the Department of Chemistry in RSU is blessed with researchers endowed with the academic potential to elevate the university to its international pride of place.

Vice Chancellor, sir, I have observed that the problem with teaching the Organic Chemistry courses in the universities can be traced back to the secondary schools, where the teachers lack the basic knowledge of the subject area. I suggest that the State and Federal Governments take steps to remedy the drawback by organizing holiday refresher courses in Organic Chemistry for their secondary school teachers.

I have found that my teaching method of making every lecture a tutorial is very useful, not only in enhancing the students' understanding but also in increasing their self-confidence. It is in the tutorials that the students' levels of understanding the topics can be better discerned by the lecturer. Take-home assignments as standalones are of no use in this respect, as the answers of 2 students can be replicated in the remainder of a class of 100. If such assignments are to serve their purpose of fostering understanding, I suggest that the students be also made to present their assignments to the class in tutorials. Lecturers are also to be discouraged from using tutorial slots for regular teaching.

There is an anomaly I observed in the university regulations while I was a head of department: students are not permitted to

transfer between departments unless they are in the WAF category. For example, a Year 2 student who wants to transfer to the Department of Science Education because they are not doing well in the Department of Chemistry may need to arrange to be on WAF status to achieve his desire. Surely, this is anomalous in a university whose academic structure is based on the course system, where courses already taken and passed can be credited to a transfer student in their new department.

I encourage academic colleagues to resist the tide of populism that is sweeping through the country. It is inherently capable of depreciating the quality of our academic products. Although our country has the tendency to compel those that "call a spade a spade" to dig with it, the consequences of playing the proverbial ostrich-head-in-the-sand are alternatives too dire to consider. The chickens will always come home to roost.

I encourage my colleagues to legitimately strive and be known for persistence in the face of obstacles, rather than take short-cuts in their desire for success. Let the words of Booker T. Washington be your guide:

"Success is to be measured not so much by the position that one has reached in life as by the obstacles he has overcome"

……..Booker T. Washington, Founder of Tuskegee University.

What's Next?

Vice Chancellor, sir, by the Grace of God, several generations of selective breeding have ensured dominant genes in me that assure good physical strength and mental capabilities into old age in their phenotypical expressions! Thus, I may be retired but I am not tired. Given the opportunity, I will like to continue the supervision of the ongoing research collaborations with foreign

institutions and initiate new ones.

The photoxidation of citronellol, a component of lemon grass oil, to citronella, a constituent of rose flower fragrance has been an economically viable industrial process in temperate countries where the intensity and duration of sunlight is low, compared to what obtains in tropical countries such as Nigeria (Wau *et al*, 2021). Thus, we are advantageously placed to exploit the natural sunlight in the manufacture of this fragrance. I intend to seek funding to explore the commercial production of this and other fragrances in Nigeria. Investors are welcome!

8. ACKNOWLEDGEMENTS

"If I have seen further than others, it is by standing upon the shoulders of giants."

……Isaac Newton

And there was light to illuminate the shoulders of many giants to stand on to see my way through from the beginning to the end of my university career. Even some persons that I thought were dwarfs have turned out to be giants in retrospect!

My utmost gratitude goes to God Almighty, the source of the physical and inner Lights that illuminated my path into specialization in Organic and Photochemistry, as I cannot imagine I would have had as much pleasure in any other area of science.

I am grateful to the Vice Chancellor, Prof. N. S. Okogbule for granting me the opportunity to re-enact the story of my career in this valedictory lecture, which is the 4th in the series. The Deputy Vice Chancellor (Administration), Prof. Victor A. Akujuru,

Deputy Vice Chancellor (Academic) Prof. Valentine Omubo-Pepple, the Provost, College of Medical Sciences, Prof. C. C. Orluwene, the Director, ICTC, my friend and University Orator, Prof. I. Zeb-Obipi, the Chairman, Senate Lectures Committee, Prof. H. Ukoima and his hardworking team members, Prof. J. Jaja, Prof. C. Ohaka, Prof. N. Nwafor and E. Egbuchu, the Registrar, Mrs. Ibimonia Harry, the Librarian, Dr. Juliet Alex-Nmecha, the Bursar, Dr. Gift Eke and their predecessors, too numerous to be individually mentioned, are especially thanked for their multifaceted assistance to me throughout my career at Rivers State University and the Valedictory Lecture today.

Apart from the pioneer Vice Chancellor, Prof. T. T. Isoun, I have been privileged to serve under the following successive Vice Chancellors: late Prof. Edward Banigo, late Emeritus Prof. Augustine Ahiazu, Emeritus Prof. Steve Odiowei, Emeritus Prof. Simeon Achinewhu, Prof. Victor Omuaru, Prof. Barineme Fakae, Prof. Blessing Didia and Prof. Opuenebo Owei. They all contributed to the progress I made in my career in the university in ways that space does not allow me to ascribe to them individually but please indulge me my partiality in especially pointing out Prof. Barineme Fakae and Prof. Blessing Didia, who discerned some redeeming values in me and took bold steps to appoint and retain me respectively as Dean of Postgraduate School during their tenures as Vice Chancellors. I am eternally grateful to you for the honour, sirs.

The administrative staff cannot be left out of the acknowledgements because my academic journey would have been bumpy without the roles they competently played in the execution of their appointed duties. I appreciate the following Registrars: Late Chief M. B. Mieyebo, Late Ven. S. S. Oguru, Mrs. D. C. Odimabo, Mrs. V. Jamabo, my good friend Dr. S. C. Enyindah and the incumbent Mrs. I. B. Harry, who served as Secretary while I was Dean of Postgraduate School. I acknowledge Dr. (Mrs.) I. Daminabo and other staff of the

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I am glad to have been born into a family where what concerns one, concerns all its members. It is impracticable to mention them all but here are a few relations out of them all, that rallied around to rescue me when I was kidnapped. Pa James Brigue, my uncle and head of the Diejeruo family and his wife, Mummy Brigue, late Pa. and late Madam S. O. Pela, my uncle and aunt who looked after me while my parents were in the UK, Uncle

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A parable in my locality of origin says that one does not hurry to go to a place where one will spend the night. So, lastly but never the least, with the greatest excitement, I recall how my nuclear family has made my life and academic journey a successful one. I am eternally grateful to my lovely wife and mother of my children, Dr. Beatrice Esegboria Fekarurhobo (nee Akhimien); you are indeed the salt of the earth. I could not have had it better. Only God can reward you for putting up with me, my faults, excesses and eccentricities all these years. You raised our children with your contagious love that has been imbibed by them and illuminated their paths into responsible maturity. To my siblings, Children and grandchildren- late Brantley, Gautney, Robin, Eunice, Julie, Mandy, Angela Ididia (nee Fekarurhobo), Dean, Darren, Sherene, Erhies, Erere Okiya (nee Fekarurhobo), Tomotigho Cookey (nee Fekarurhobo), Okeoghene, Osheho, Ogheneyoma, Shae, Kayon, Isaiah, and

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Ladies and gentlemen all, I acknowledge your honoured presence. May the Light continually shine on you, to illuminate your paths.

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