

**RHODES GRADUATION ADDRESS: APRIL 10, 2010**

**Chairperson of the Rhodes Council, Honorable  
Mr Justice Jos Jones; President of the Rhodes Convocation, Dr. Simon  
Gqubule; Distinguished Rhodes Faculty and Staff; Fellow Graduands,  
families, and friends;**

Firstly, I wish to express my sincere thanks for the great honor you are bestowing on me. Receiving such an honor and recognition from my alma mater is an undoubted highpoint of my career, and is a truly humbling experience. It is a pleasure and privilege to be sharing this occasion with these fine, talented young men and women, on this, their special day, and I sincerely congratulate them all on reaching this most significant milestone in their budding careers!

I hope you will forgive me if I start by reminiscing briefly about my bygone Rhodes days. It is amazing to think that it is very nearly 50 years since I departed from Rhodes – in fact it was in the summer of 1960 that my brother Donald and his wife, Doreen, who I am delighted are sharing this wonderful occasion with me, drove me down to PE to board the Pendennis Castle sailing for Southampton. On that momentous trip, I was joined by my good friend, Arthur Howard, who had shared nearly 8 years of parallel development in chemistry at Rhodes with me, and now we were proceeding to those two great archival UK

institutions, Oxford for me, and the "other place" known to its admirers as Cambridge, for Arthur. Despite this 'parting of the ways', Arthur and I continued to follow parallel paths – we even organized cricket and rugby confrontations between our two respective labs, and we eventually migrated to the States for postdoctoral study, both meeting our future wives, and in passing, gaining some useful advanced research experience. Arthur was best man at my wedding to Jacqui in North Hollywood in late 1966, and it is truly wonderful that Jacqui is here sharing this very special occasion with me. To complete the Arthur-Gordon saga, we both eventually ended up in the States, and Arthur has just retired from his professorship at East Michigan State University in Ypsilanti. **To me, this illustrates one of the many wonderful features of Rhodes – one makes friendships that last through the decades!**

The Rhodes of those early days was very different to the culturally diverse center of academic excellence which we are all privileged to see today. Arthur Howard and I studied chemistry under the late Professor William Barker who played a pivotal role in promoting chemistry at Rhodes, and I am happy to see that he is remembered through the annual Barker Lecture. We both gravitated to organic chemistry, and despite some unsupervised dabblings in the realm of natural products chemistry research, we did not progress to any Rhodes degree beyond B.Sc. Honours. Our only research achievements were the isolation of a few pure chemical compounds from the local flora, and these 'discoveries' presented insurmountable challenges since we had no access to any tools for the

elucidation of their structures other than an old manually-operated Beckman UV spectrometer in the Physics Department. However, some moments of potential enlightenment were provided by sympathetic colleagues at the CSIR in Pretoria, most notably Drs. Doug Rivett and Jean DeVilliers, who generously ran infrared spectra for us. The spectral traces provided back to us, however, were total mysteries of miscellaneous peaks and troughs which were largely beyond our comprehension since we had not received any training in organic spectroscopy. This was my first contact with Doug Rivett to whom I owe a huge debt of gratitude. It was Doug who served as an early mentor and role model, and inspired young chemists such as myself and colleagues at Rhodes and elsewhere to persist and aim for higher goals. Jacqui and I were deeply saddened by the recent passing of Doug, and I wish to pay tribute here to Professor Rivett as a true giant and pioneer of organic and natural products chemistry in South Africa. I am greatly honored that his widow, Lettie, is present at this gathering, and I want to assure her that Doug provided a continuing source of inspiration which guided me through my subsequent career. I am forever grateful to him!

Well, enough reminiscing about the old Rhodes days. Happily, we have moved on to a totally different social and academic scene full of excellence and outstanding achievement. This is particularly evident in the scientific area. I would like to mention just one of many examples, that of the outstanding research of Professor Tebello Nyokong in nanoscience and nanotechnology, and

particularly her studies of the photodynamic therapy of cancer, which have received international acclaim. She has been recognized by many prestigious awards, most notably the L'Oreal-UNESCO award in 2009 for "Women in Science" as the Laureate representing Africa and the Arab States – a signal honor for her, Rhodes, and South Africa! This is just one example of the outstanding achievements of Rhodes faculty in both the research and teaching spheres which have contributed to the excellent education received by those who are graduating today. I say to these young graduands, you can feel truly proud to have received degrees from Rhodes University – these degrees will stand you in good stead anywhere in the world, whether you are proceeding to advanced learning and research in this country or overseas, or whether you are now launching into a new job and career.. **I urge you to remember with gratitude the tremendous start which your Rhodes mentors, faculty and staff have provided as you launch into your future careers. Through their outstanding teaching and research, you are now qualified to work and compete with the your peers anywhere – never forget to show your appreciation for all you have received here, and show your loyalty to your Alma Mater!**

As you launch off into this world of exciting opportunities and challenges, I would like to recall some of the attributes which I feel have most influenced my career and service.

**1. REMEMBER, LEARNING NEVER ENDS.** You will never cease to learn, whether it be from colleagues in your own department or place of work, or colleagues from other organizations both in South Africa or abroad. **And remember, you will only learn by being a good listener. Listen carefully to others, and show respect and humility when interacting with colleagues, especially those from other countries and cultures. Seek to understand and do not be quick to dismiss others' viewpoints and interpretations! Humility is of the essence** – do not assume that because a collaborator may not appear to have as good an educational qualification on paper as you have, that their views and experience are not of significant value. You never know where and when you may pick up some gem of information which could change the whole direction and impact of your research or career! I have had the privilege and pleasure of learning much from colleagues in many countries who have changed and improved approaches being taken by the US National Cancer Institute (NCI) in tackling problems of importance to the anticancer drug discovery efforts. **At the same time, don't hesitate to share your knowledge and experience with others – after all you also have much to offer.** The combination of good ideas and experiences invariably leads to better science, more productive collaborations and ultimately to significant benefits for all parties. If I may paraphrase a comment made by Dr. Badat in his address to graduands in 2009: **"Wisdom is derived from vigorous intellectual debate, knowledge, and understanding and can serve to promote great public good"**

**2. YOU ALSO LEARN THROUGH CAREFUL OBSERVATION.** Always be **inquiring and observant**, and never lose your sense of wonder and awe at the beauty, complexities and precision of our universe, our planet and the biological systems around us, as exemplified by our own human bodies. In my area of drug discovery from natural sources, **much can be learned from observing the Nature around us.** Why does a particular tree or plant never seem to get fungal infections or have lichens growing on it? It is defensive chemistry in action. For instance, the natural chemical taxol first isolated from the bark of the Pacific Yew tree prevents the growth of pathogenic fungi on the bark, but it was developed into some of the most effective anticancer drugs yet discovered (paclitaxel and docetaxel or taxotere). And I'm sure Professor Davies-Coleman can tell you of brightly colored sea slugs without any shells which he has found lurking on coral reefs while SCUBA diving in Algoa Bay or at Tsitsikama. These apparently defenceless creatures are not touched by the hosts of ravenous predators swarming around them – WHY? – yet another example of chemical defence in action! The potent toxins they produce are not only highly effective deterrents to any would-be predator, but are also serving as models for the development of effective drugs for the treatment of various cancers and other human diseases. Thus, the overall message is: **be observant of what is going on around you! Nature may be telling you something of great significance!**

**3. AND YOU CAN ALSO LEARN FROM MISTAKES!** The classic example is the discovery of the penicillins by Sir Alexander Fleming in the late 1930s. To make a

long story short, some migrant fungal spores from a laboratory downstairs found their way into a petri dish in which Sir Alexander was growing some *Staphylococcus* bacteria, and which he had carelessly left exposed on his laboratory bench. Sir Alexander noticed on returning from his month's summer vacation that some of the bacteria he was growing in his petri dish had been killed off. Now many, including myself, would probably have muttered a subdued curse about a failed experiment and dispatched the petri dish to the trash bin, but Sir Alexander, being an expert on antiseptics, concluded that the bacterial growth had been inhibited by a mould. The migrant fungal spores happened to be good producers of penicillin, and the rest is history! His **keen observant eye and intellect** led to the discovery of the penicillins and the birth of the Golden Age of Antibiotics, saving countless millions of lives! And serendipity continues to play a critical role in drug discovery and the discovery of other processes, **so the clear message for us is to observe and think carefully before you despair and discard an apparently failed experiment – fame and fortune may await you!**

**4. Embrace MULTIDISCIPLINARY COLLABORATION** whether it be with colleagues in your own department or other departments, or with colleagues at other institutions, both on the national scene or at international levels. True multidisciplinary, and frequently international, collaboration is the only way to maximize your levels of achievement and contributions to your community, country and the world at large. During my tenure at the National Cancer Institute I

had the privilege and pleasure of collaborating with colleagues from over 40 organizations located in over 30 countries. One of the best experiences has been collaborating with Prof. Mike Davies-Coleman and Rhodes University in the exploration of the rich marine biodiversity found off the South African shores as a source of new anticancer drugs. Another has been with the CSIR in Pretoria in the search for new anticancer drugs from the incredibly rich South African flora. I must emphasize that these, and all collaborations, are performed subject to collaborative agreements which ensure that there is "equitable collaboration and benefit-sharing" between all parties, and that the rights of the host country, such as South Africa, are protected at every level. The NCI has been involved in some way in the development of most of the anticancer drugs currently available, and despite an impressive annual budget of over \$5 billion, these developments have only been possible through collaborative research with scientists in multiple countries worldwide. Money isn't everything! **Research breakthroughs and effective new drugs are achieved only through true multidisciplinary and international collaboration, and I fully expect that one or more**

**natural products will one day yield valuable drugs to fight cancer, malaria or other serious diseases. Thus, I applaud the moves by Rhodes to establish collaborations with universities and research organizations throughout Africa and the world, including in China, such as that with Jinan University in Guangzhou. This is the only way to go!**



## 5. MAINTAIN HIGH STANDARDS OF ETHICS, MORALITY AND HONESTY IN YOUR RESEARCH, YOUR WORKPLACE AND IN DEALINGS WITH OTHERS.

Research generally leads to opportunities for promoting the betterment of humankind, but often also has the potential for negative and destructive outcomes. One of the most prominent cases is that of the awesome power released by the splitting of the atom with its huge potential for peaceful use in nuclear medicine and the generation of nuclear power, but it also has potential for destructive use in the development of nuclear weapons. More recent challenges lie in research on stem cells and genetically modified crops and organisms, both of which have tremendous potential for the good of humankind in the treatment of diverse diseases and the feeding of hungry millions, but these technologies could also be used for negative purposes. Much of the onus for decision-making lies with the scientists in demonstrating to the public and politicians that they will follow the most ethical course, and that effective measures will be adopted to discourage and control unethical uses. Personally, I am all in favor of promoting the path of good uses – let's adopt a positive attitude to counter the gloom of the naysayers! **Most of us are not confronted with such serious ethical challenges, but we all need to understand that the award of a degree carries with it the obligation to maintain the highest moral and ethical standards, the responsibility to behave with impeccable integrity, and the commitment to selfless service of our local, national and global communities.**

Again, I congratulate you graduands on your outstanding achievements which have placed you at the threshold of a challenging and exciting life. Having earned a degree from Rhodes University places you in a position where you will be expected to exercise sound judgement and leadership. **As I've mentioned, this brings with it significant obligations and responsibilities, and you will need keen observation, a continuing desire to learn, and a sense of humility coupled with patience, persistence, and commitment, and not least, a willingness to collaborate amicably and fairly with others, to get the best results. And as Dr. Martin Luther King said, "keep your eye on the prize" – ultimately that of serving your fellow humans with perseverance, and with respect for human dignity and human rights. Thank you**

