GEOLOGY IS BACK – WITH ALLIES:
The University of Limpopo plugs into the province’s mining bonanza

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Read about the links between science and technology and sustainable economic development
South Africa's future is locked up in the dreams of our children with their unclouded aspirations and needs. And, because their inheritance includes benefits from South Africa's mineral wealth, we think of their dreams as opportunities. That's why we uplift communities around the mines through job creation, schools, clinics and infrastructure. But we also facilitate those who seek more benefits from platinum applications for our people. Best of all, nobody is excluded as every South African benefits from taxes and foreign reserves earned through export.

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RESEARCH ARTICLES IN SUBSIDISED JOURNALS


A LOT HAS BEEN HAPPENING IN THE MINING ARENA IN LIMPOPO PROVINCE IN RECENT YEARS. In fact, the entire country is now locked into a mining boom caused primarily by legislation designed to optimise exploitation of our mineral resources and maximise the benefits to local communities. Of course, the boom has revealed skilled manpower shortages which represent a major opportunity to the University of Limpopo. New impetus has been given to plans, first mooted at the turn of the century, to establish a fully-fledged School of Mining at Turfloop. Certificate and diploma courses have been offered since 2004. Now, a major step forward has been achieved with the establishment of a brand new Department of Geology, Mining and Metallurgy under the leadership of Professor Georges-Ivo Ekosse, a highly-qualified scientist originally from the central African country of Cameroon. Support from the Department of Minerals and Energy, from the provincial government, and not least from Trade and Investment Limpopo, seems likely to mean the introduction of mining engineering courses before too long.

Turfloop’s state-of-the-art Materials Modelling Centre has received a major boost with the award of a research Chair to the centre’s director, Professor Phuti Ngoepe, and selection as one of only three flagship projects attached to the Centre for High Performance Computing recently established in Cape Town. In a wide-ranging interview, Ngoepe discusses the rising national and international awareness of the links between science and technology funding and poverty alleviation in the developing world.

Since 1994, nurses have played an increasingly important role in South African health care, particularly in the rural areas. In this issue meet some of the women of the lamp (and a few men) who discuss their callings, their concerns, their responses to the nurse shortage in Limpopo, and their commitment to the training of new nurses to staff a health care system that places nurses as frontline workers in hundreds of countryside clinics.

Also in this issue, we’ve found space to publish a comprehensive index of the first ten issues of Limpopo’s premier in-depth information source, Limpopo Leader, and details of how you can donate an indexed set to a school or organisation of your choice. Your generosity could help to change the lives of surprising numbers of information-starved learners.
Dr Georges-Ivo Ekosse, co-ordinator of Turfloop’s new Department of Geology, Minerals and Mining, explores the rich vein of opportunity presented by Limpopo’s mineral wealth.

Plugging into Limpopo’s mining bonanza: BACKGROUND TO A VITAL PARTNERSHIP. The importance of a university response to the provincial Growth and Development Strategy as it relates to mining.

Plugging into Limpopo’s mining bonanza: GEOLOGY IS BACK – WITH ALLIES. Details of the new Turfloop Department of Geology, Minerals and Mining, and the man who’s putting it all together.

Plugging into Limpopo’s mining bonanza: TEAMWORK WILL WIN THE DAY. Powerful off-campus support for the new Mining School moves at Turfloop.

The first ten: BE A PHILANTHROPIST AND SCORE! Here’s a chance to make use of indexed sets of Limpopo Leader magazines to enrich the lives of school learners AND enhance your reputation as someone who cares ...

The first ten: INDEX TO THE FIRST TEN LIMPOPO LEADER MAGAZINES.

Women of the lamp: WHERE IT ALL BEGAN. A short résumé of the achievement of Florence Nightingale, founder of trained nursing as a profession.

Women of the lamp: NURSING AT THE ACADEMIC LEVEL. The departments of nursing on both campuses of the University of Limpopo help to support the fundamental change in South African health care policy since 1994.

Women of the lamp: AND AN INCREASING NUMBER OF MEN. Meet the national president of the Democratic Nurses Organisation of South Africa. He’s a man – so are more and more trainee nurses.

Science and Technology: WORLD-CLASS MATERIALS MODELLING FOR AFRICA. A new research Chair emphasises the importance of science in sustainable economic development.

Profile: WORKING FOR THIS BRILLIANT PROVINCE HE CALLS HOME. Here’s a man who’s written a substantial book on the University of Limpopo and works for the Province.
EVERYONE KNOWS THE BASIC FACTS. On one side there’s the fact that Limpopo is lavishly endowed with mineral wealth. On the other, there’s the fact that the provincial government has made the exploitation of this wealth a fundamental component of Limpopo’s Growth and Development Strategy (LGDS).

Let’s unpack these basic facts a little.

By far the most significant mineral resource is the vast reserves – the world’s largest – of platinum group metals lying at varying depths beneath the surface of the province. Also available in great quantities are coal and diamonds, not to mention iron ore and chrome, copper, phosphate, nickel, tin, vanadium and titanium. Over R7-billion has already been invested in mining, and for the potential to be fully exploited, a lot more money will be required.

In October 2004, the provincial government adopted its LGDS where mining was recognised as one of the three mainstays upon which the economy had been built and should be developed into the future, the other mainstays being agriculture and tourism. The need for a LGDS is obvious. Despite its many advantages (climate, low crime rates, etc), Limpopo remains the poorest province in South Africa, with the country’s highest unemployment rate, and 60% of the population of 5.5-million living below the poverty line. It’s no wonder that the fundamental principle adopted by the LGDS is straightforward: ‘Development is about people’. For the task is not simply to grow the economy, but to create strategies that enable more and more people to benefit from that growth.

This is especially the case in the mining sector. The capital-intensive nature of the sector can be gauged by the following statistic: while a R1-million investment into agriculture will create around 50 sustainable jobs, R1-million in mining will create only three or four. Yet the rewards for investors in mining are enormous. The job of the provincial government, therefore, must be to find ways of spreading the mining-induced economic opportunities as widely but as locally as possible. The provincial authorities have some assistance in this from the Mining Charter, and from the concept of junior mining that was discussed more fully in Limpopo Leader 2, Summer 2004 edition. To support these inducements, it is essential that local people are trained to fulfill the skills demands of the mining industry.

If the LGDS is to be as people-centred as it claims, it is essential that the situation be avoided where the scientific and technical expertise required for mining is largely imported – as in a significant number of cases in South Africa – from Great Britain and other developed countries. Clearly, the most desirable way of avoiding this, is to train local people in local institutions.

Enter the University of Limpopo.

What follows in this special Limpopo Leader focus – aptly entitled ‘Plugging into Limpopo’s mining bonanza’ – examines the on-campus progress that has been made in fulfilling this fundamental LGDS need as it applies to mining. It’s a crucially important partnership that is developing between the university and the provincial authorities, with both sides responding to the other for the benefit of the development of the people of the province.
AT THE END OF 1989 THE GEOLOGY DEPARTMENT AT TURFLOO, IN EXISTENCE FOR 21 YEARS, CLOSED ‘FOR ECONOMIC REASONS’ JUST AT THE TIME WHEN PLATINUM MINING IN THE PROVINCE HAD GOTTEN INTO TOP GEAR. An indication of what gear platinum mining was in can be seen by the commissioning in mid-2003 of Anglo Platinum’s R1.4-billion platinum smelter plant near Polokwane. From the university’s point of view, it was undoubtedly an opportunity lost. That’s the bad news. But there’s good news as well.

It is that geology is back, and with it comes mining and minerals as well. It was late in 2006, as the culmination of years of discussion and planning around the university’s role in mining education, that the Faculty of Science, Health and Agriculture Board approved the establishment of a Department of Geology, Mining and Minerals within the Faculty’s School of Physical and Mineral Sciences.

‘Africa has huge mineral resources,’ says Dr Georges-Ivo Ekosse, co-ordinator of the new department. ‘But African mining graduates trained overseas have to re-adapt to African ground truths. It therefore makes a lot of sense to train them locally. That is the motive force behind the new Turfloop department. We want to take up the opportunities that are presenting in Africa – and of course especially in our own Limpopo province.’

Cameroonian-born Ekosse is an Applied Chemist, Geologist, Mineralogist, Metallurgist and Environmental Scientist who holds two master’s and two doctorate degrees in his various fields. At the Clay Minerals Research Laboratory at Indiana University in the United States, he researched on various laboratory analytical techniques in evaluating clay minerals for different industrial applications. He has attended several professional courses and specialised in the science and techniques of X-Ray

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‘I’M MAKING A SERIOUS APPEAL,’ SAYS DR GEORGES-IVO EKOSSÉ, HEAD OF TURFLOO’S NEW DEPARTMENT OF GEOLOGY, MINING AND MINERALS. ‘We can’t do full justice to the idea of training and research for the mining sector – or for that matter to the need for more and more decentralisation of South Africa’s intellectual resources to service the historically under-resourced – without a great deal of help. You’ve seen our staffing needs. You’ve seen the sort of infrastructure and laboratory facilities that we need. Please help us with cash or kind. Your contributions won’t be wasted.’

Ekosse pinpointed several categories of potential partners in the task ahead:

‘Firstly, I wish to address myself to the BEE magnates who have prospered in South Africa since 1994. To them I say, please assist us in whatever way you can to make black economic empowerment a reality for thousands of young people interested in geology and mining. Your contributions will not be forgotten. Then there are the mining companies operating in Limpopo. Talk to us about your manpower and research needs. Help us to help you by building a world-class academic facility on your doorsteps.

‘And what about the graduates of geology from Turfloop in the 1970s and 1980s? There must be plenty of you. We’d love to talk to you about our plans. I happen to know that the current CEO of the Council for Geo-Sciences in South Africa, Thibedi Ramontja, is a geology alumnus. That’s a definite source of pride for us at Turfloop. Where are the rest of you?

‘Finally, there are the sons and daughters of Limpopo Province, and of course the many thousands of Turfloop graduates in general. Please help us to build our new department into a facility that is relevant to the demands of a burgeoning industry – and to the hunger for learning of young Limpopans that is so obvious through the large numbers of enquiries that we are receiving every week, especially about the degree courses.’

Dr Ekosse can be contacted for further details on ekosseg@ul.ac.za or by phone at 015 268 2541.
Diffraction (XRD) related to mineralogy, mining and the biophysical environment. Dr. Ekosse is a member of numerous scientific societies and associations, and is also the recipient of a number of international awards and prizes. His pioneer research and publications activities embody several aspects of minerals and mineralogy, mining and the biophysical environment in Africa, and he has studied, researched and published on samples of soils, clays, ore bodies, rocks and minerals from Botswana, Cameroon, Kenya, Mozambique, Nigeria, Pakistan, Senegal, South Africa, and USA. He has written two books and has more than one hundred publications under his academic belt.

Like most Cameroonians at the time, he explained, he was faced with the choice between English and French tertiary education. ‘Those who chose the English route went to Nigeria, and with good financial support, to Britain or USA,’ he says. So he went to Nigeria, to Ibadan Polytechnic to do his undergraduate studies in Applied Chemistry.

Since then, he’s studied and worked in Cameroon, Nigeria, Senegal, the United States and Botswana. ‘In fact,’ he points out, ‘I was the scientist in charge of the X-Ray Diffraction Unit at the University of Botswana in Gaborone before making the decision to come to South Africa.’

Ekosse arrived at Turfloop last June. He spent his first few months formalising the certificate courses in mining that Turfloop has offered for some years, but ‘in an ad hoc manner’ as Ekosse remarks. An important task now being undertaken with the Offices of Institutional Planning and Quality Assurance at the university is to ensure SAQA accreditation for all mining courses offered at Turfloop. ‘At the same time,’ he adds, ‘we’re building partnerships with South African institutions, as well as with those in other parts of the continent. It has been our aim all along to build programmes with an international image and usefulness.’

Ekosse refers to the ‘excellent collaboration’ that he has received from the South African Council for Geo-Sciences, M IN TEK, and in particular the University of Pretoria, and Anglo Platinum/ Anglo American who have large mining operations in Ghana and Guinea. Training and research arrangements for people from these parts of the continent may well result from these interactions.

‘But our first focus is to draw students from Limpopo. That’s where the majority will come from. But there will be people from other South African provinces and from other parts of Africa as well. Very definitely. Let me tell you that the demand for our courses, particularly the degree courses, is already huge.’

Time now to look at what exactly Turfloop’s new Department of Geology, Mining and Minerals will be offering. Here’s the list.

- Certificate and advanced certificate courses in mining and minerals on offer, as well as a diploma course in the same subjects.
- Starting next year (2008), the department will begin with its first intake of students enrolled for the four-year BSc Geology course.
- In 2009, the four-year courses leading to BSc Mining and BSc Minerals Processing and Metallurgy qualifications will accept their first student intakes.
- Postgraduate degrees to doctorate level will be offered in all disciplines, and several specialised graduate diplomas are also being planned.

‘By 2012 we’ll be at full capacity,’ Ekosse estimates. ‘We’ll have 600 to 700 students in the department, and we’ll be releasing graduates into the world of work at the rate of approximately 100 a year.’

Ekosse is careful to emphasise that the new department does not see itself in competition with existing institutions with geology and metallurgy training programmes.

‘There are two points to be made here,’ he says. ‘The first is that the existing universities can’t meet the demand from the markets. The second is that there is a major shift in mining activity from gold and diamonds to the platinum group metals and industrial minerals – and of course coal. Since Limpopo province is at the epicentre of the new mining focus, we believe it is absolutely appropriate that the premier
Limpopo university should make a major contribution in the form of appropriate training and research.’

Ekosse added that engineering – perhaps in the form of a Faculty of Engineering and the Built Environment – would inevitably follow at Turfloop at some point in the future. ‘The importance and logic of these progressions can’t be over-emphasised,’ he says, ‘especially for South Africa’s historically disadvantaged peoples and regions. It has to do with the very necessary decentralisation of the country’s intellectual resources.’

The infrastructural and staffing implications are enormous. For the new Department of Geology, Mining and Minerals, a new building is being contemplated; and Ekosse has already worked out exactly what is required. Quite apart from adequate lecturing facilities and the around 40 offices to house the necessary administrative and academic staff in the three disciplines within the department, the laboratory needs are extensive. Listen to the basic list:

- For geology, the requirement is for a basic geology and petrography laboratory, as well as laboratories for optical mineralogy, cutting and polishing, geochemistry, and instrumentation, and two dedicated research laboratories.
- For mining, a basic mining laboratory is needed, plus rock mechanics and instrumentation laboratory facilities, and a specialised research laboratory.
- For minerals processing and metallurgy, laboratory facilities are required for ore dressing, extraction and physical metallurgy, hydrometallurgy, mineral processing – as well as specialised instrumentation and research laboratories.

According to Dr Ekosse, the staffing needs of the new department – once it is operating at full student capacity – will require, for geology, one professor and one associate professor, two senior lecturers, three lecturers, two post-doctoral fellows, two visiting scholars and four technical staff. That’s a total of 15. The other two disciplines – mining and metallurgy – would require similar levels, but with fewer actual posts, resulting in a need for nine academic and technical staff each.

‘This new department is going to make a major impact on mining and related skills training to serve the development of Limpopo – and Africa in general,’ says Ekosse, and it’s easy to see that he has placed his own personal commitment to underwrite the determination of his words.

When asked if he had grown up near mining operations, he shook his head. ‘My hometown is Bonjongo, a small village in southwestern Cameroon between the mountains and the Atlantic Ocean. I grew up in the middle of plantations: palms, rubber, bananas. My first scientific question was: why do plants grow. That’s where my passion for soils began. Also, in my home, I was exposed to books, and I developed an early interest in science. Soils, rocks, mining, minerals,’ he added with a smile. ‘That’s a logical continuum, don’t you think?’
Plugging into Limpopo’s mining bonanza
TEAMWORK WILL WIN THE DAY

Support for Professor Georges-Ivo Ekosse’s new Department of Geology, Mining and Minerals at Turfloop is already widespread. But there are two sources of allegiance that are fundamental to the new venture’s eventual success. The first is the regional office of the national Department of Minerals and Energy (DME). The second is to be found within the province’s economic development organisation, Trade and Investment Limpopo (TIL).

Listen to some opinions.

Here’s Freddy Chaba, TIL’s sector manager for mining. ‘We’ve been working on the idea of a Mining School at Turfloop since 2001. Now the idea is becoming a reality. But it’s important to see everyone who’s contributing as members of a single team: there’s the university, there’s TIL, there’s the Department of Mining and Energy, and there’s the provincial premier’s office.’

Ross Rankapole, regional manager of Limpopo’s DME office in Polokwane, echoes Chaba’s perception of a team working for the common good. ‘There’s just one end that we all seek, and I can’t see how our quest will fail. We have the Mining Charter and the Social and Labour Plans that are regulatory tools on our side; and the demand for mining training and skills is huge. Only a fully-fledged Mining School in the province can adequately satisfy that demand.’

Chaba’s involvement in the proposed Mining School at Turfloop began in 2001. A co-ordinating team was established, with Chaba as chairperson, to examine the feasibility of a Mining School in Limpopo.

‘We went on several fact-finding trips overseas, to the United Kingdom and particularly to Canada where several universities have specialised in mining research and education. At home, we canvassed the mining companies operating in Limpopo and were greeted with strong support. We also held meetings with the Chamber of Mines, and with Wits and Pretoria universities. Clearly, our feasibility report recommended the launch of mining training at the University of the North, as it was then called.’

By 2004, Turfloop was offering the certificate and diploma courses referred to in more detail by Professor Ekosse in the article that begins on page 6. Thanks to a co-operative agreement, Wits provided the teachers for some of these courses. To date, more than 300 certificates have been awarded. Chaba points out that many municipalities took advantage of the courses on offer. In particular, local authorities directly affected by the new mining boom had been anxious to ensure that selected municipal officials knew some of the basic legal and operating implications of the Mineral and Petroleum Resources Development Act of 2002, legislation that was finally promulgated in 2004.

Rankapole explains how the new legislation changed the face of mining in South Africa, and gave rise to the urgent need for locally trained and skilled mining scientists, artisans, entrepreneurs and technologists.

‘It’s true that the old Minerals Act of 1991 was based on the principle of “optimal exploitation”, due to the dual system of mineral ownership in terms of which minerals could be owned privately or by the State. The majority of these rights were in fact held privately, meaning that private owners of mineral rights could thwart the optimal exploitation of the natural resources. This resulted in the slowing down of mining activity, which in turn detrimentally affected job and wealth creation. Since mineral rights could be owned independently of title to surface use (usually farming), and since most of the mineral rights had been snapped up long ago by the large mining houses, the rate at which mining took place was effectively controlled by the big companies.

‘But the new legislation effectively changed all that,’ he explains. ‘The central tenets of the Mineral and Petroleum Resources Development Act are, inter alia; state custodianship and equitable access to natural resources and sustainable development. But to ensure that this happens, the Act stipulates that mineral rights should fall under the custodianship of the State, and that all holders of new mining rights should start
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TEAMWORK WILL WIN THE DAY

historically disadvantaged South Africans and women-encompassing entities. This is absolutely what the legislation was designed to do, among other objectives: to optimally exploit what we have in such abundance under the ground; to challenge the monopolies of the big companies and seek to create a balance and global competitiveness in the industry; and, aided by the Mining Charter, to transform the industry, to compel a more equitable and representative sharing of the benefits and to ensure that mining contributes meaningfully and substantially to local economies.'

But arising directly out of these developments has come a major challenge. In short, the boom has
generated a crisis in the supply of skills in the fields of geology, metallurgy and mining engineering.

‘I want to dwell on this crisis for a moment,’ Rankapole goes on. ‘Since Limpopo isn’t the only province experiencing the boom, there is intense competition for trained personnel. If you look at the gradual stabilising of mineral-rich countries like the DRC and other neighbouring states such as Mozambique (which supply a lot of skilled mining labour to us), we may one day be faced with the situation where that labour force decides to return to their own countries in order to boost their own booming mining economies and we may then wake up to find that we have no trained skills of our own. If you consider the fact that some of the countries are beginning to stabilise and are will therefore attract more mining investment, then one can easily add an international dimension to the intense competition developing around adequately trained mining personnel. Imported expertise can be more easily enticed away than locally rooted and locally trained people. We need to add to this situation, the skewing effects of apartheid. Historically, black universities have not been known for the generation of specialised technological skills. The result is that there are very few black mining geologists, mining engineers and artisans, as well as black mining entrepreneurs.

‘Obviously, all these considerations are compelling arguments that underpin our support and enthusiasm for what is beginning to happen at Turfloop.’

Initial support from the regional office of the DME comes in a tangible form. The Lebowa Minerals Trust, which had been used to administer mining royalties accruing to the old Lebowa homeland, was abolished in the early 2000s, leaving assets of R60-million that were transferred into the national Treasury. Now, says Rankapole, a DME proposal is urging that R20-million go to the establishment of the Department of Geology, Mining and Metallurgy at the University of Limpopo.

Rankapole feels that ‘such a contribution will go a long way towards supplementing Government’s ASGISA and JIPSA programmes’. He adds that he has already urged a few mining giants in the province to support the new department as part of their projects for the Social and Labour Plan. ‘They are the ones who stand to benefit from the trained and skilled personnel that will be produced by the Mining School.

‘The fact that a partnership has been established with Cambrian College and Queens University, both leading mining institutions in Canada, represents a huge plus for Limpopo because it will allow our students to have exchange programmes and tap into the skills and training bases of established mining economies,’ adds Rankapole.

It is worth mentioning here that the University of Pretoria, according to Freddy Chaba, has ‘come on board’ with regard to mining engineering. The relationship is developing, and it is hoped that the established Pretoria mining engineering degree will form the basis of the degree to eventually be offered through the new Mining School.

‘Given the urgency of the need, engineering training in Limpopo province could be coming a lot sooner than everybody thinks,’ Rankapole says. ‘What about a first intake of students in 2009? We think that with the initial encouraging indication of possible support from corporate business, and from Government, we are not being presumptuous.’

But the major thrust towards the mobilisation of financial support for the new Mining School will begin in earnest this year. ‘Given the obvious infrastructural needs – offices, laboratories, lecture halls – a new building will be essential,’ says Chaba. ‘Possibly it will be built at Edupark in Polokwane, although Professor Ekosse’s new department will obviously begin operating next year in existing accommodation at Turfloop. But a new building is definitely on the cards. We probably need to look at a figure of around R350-million. We are hoping to find seven donors, companies or individuals, who would be prepared to commit R50-million each in return for naming rights on the various blocks in the new Mining School infrastructure.’

Rankapole adds: ‘If we want people to invest, we have to show what’s in it for them. That won’t be difficult at either a national or a provincial level. Locally produced mining skills is the only way to respond adequately to the mining boom, otherwise mining houses will waste a lot of money ratcheting up salaries to retain imported skills in a highly competitive climate. Equally important, though, we need to demonstrate that we as a team believe in our industry and its growth here in Limpopo. That’s why we’re putting our efforts and energies into this project. We’re investing because we believe. Now follow our example, we say to potential funders, for your own advantage.’

Through this kind of support, the province of Limpopo and the university that bears its name, stands poised to make a major impact on mining in its corner of the African continent.
HERE’S A CHANCE TO MAKE USE OF INDEXED SETS OF LIMPOPO LEADER MAGAZINES TO ENRICH THE LIVES OF SCHOOL LEARNERS AND ENHANCE YOUR REPUTATION AS SOMEONE WHO CARES ...  

WE STARTED talking about the idea of a subject index in Limpopo Leader 9. We promised it for Limpopo Leader 10 – but there was simply too much else that we had to publish to be able to fit it in. Now here at last, in Limpopo Leader 11, we are proud to present it to our readers.  

And with it comes a multi-faceted special offer.  

But first a question. What’s so special about an index? The answer is that it makes even more accessible the well over 100 articles published in Limpopo Leader in the 10 issues that have appeared since the magazine was launched in August 2004. Readers will have noticed that the magazine is subtitled Dispatches from the University of Limpopo. This has guaranteed that its pages are always packed with high-quality scientific and social development material of interest to people living in Limpopo, and indeed to those living in adjoining South African provinces, as well as neighbouring SADC countries. The emphasis has always been on quality, not only of the printed word but also of the hundreds of accompanying photographs.
# The first ten

## INDEX TO THE CONTENTS OF LIMPopo LEADER MAGAZINES FROM AUGUST 2004 TO DECEMBER 2006

**How to use the index:** It's been arranged in topic order, with the name of the article and interviewee/s given in each case. The issue reference used to locate the article—eg LL8/20—should be read as follows: the desired article can be found in *Limpopo Leader* 8, on page 20.

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The Limpopo Leader

What are the Limpopo Leader?

What are the Limpopo Leader?

What are the Limpopo Leader?
# MAGAZINES FROM AUGUST 2004 TO DECEMBER 2006

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The world is now full of them. And nursing has changed from a menial specialisation for servant girls into a serious profession. Interestingly, it’s a profession still dominated by women who hold aloft Nightingale’s famous lamp as a symbol of their modern-day care and expertise. This sentiment is clearly expressed in the vision of the South African Nursing Council, which is ‘commitment to excellence in quality humane nursing care for all’.

In the pages that follow, readers can find out more about the sort of training that South Africa’s nearly 200,000 nurses have been exposed to, and the role of academia in maintaining standards and pushing the boundaries of that essential science.
‘Our department was established in 1981,’ says Professor Elsie van Aswegen, head of the Medunsa department, ‘not all that long after the founding of Medunsa itself. Last year (2006) we celebrated our 25th anniversary. In that time, the department has produced 1400 graduates. That’s well in excess of an average of 50 graduates a year. And let me tell you, we’re very proud of the achievements of a great many of our past students.’

To emphasise what she is saying, Van Aswegen introduces one of her senior lecturers, Joyce Mokoena. ‘Joyce was one of the original students here in 1981,’ she says. Mokoena smiles, then mentions that she is still studying. She’s one of six current postgraduate...
students registered for a PhD. ‘Interestingly,’ Van Aswegen remarks, ‘we both joined the lecturing staff here on the same day in 1990.’

Both women discuss one of the central challenges for nursing in post-apartheid South Africa. It relates to the new demand on nurses as frontline health professionals, particularly in the Primary Health Care (PHC) clinics, and the bottleneck in training facilities.

‘The year 1994 marked a fundamental change in health care policy in South Africa,’ they say. ‘The PHC concepts developed at key conferences in Alma-Ata and Bamako were introduced in the form of PHC with full district coverage of the entire country. This replaced the more hospital-centred urban-based curative system favoured by the previous regime. But this change placed increasing diagnostic and administrative loads on nurses, particularly in the deep rural areas; and the general call was for more and more nurses capable of staffing the increased PHC coverage demanded by the new policy.’

But the demand for more nurses is hampered by the realities of supply. Nurses can only be trained in hospitals offering the entire array of procedures for which they will be responsible at the clinics. According to Van Aswegen and Mokoena, the hospitals simply can’t cope with so many students. As they put it: ‘There’s simply not enough learning experience to go around. As it is, trainee nurses doing midwifery, for example, are sharing the available pregnant women with medical students. There’s clearly a limit to the number of nurses who can be trained per birth, if standards are to be maintained.’

Mokoena shows Limpopo Leader a ward attached to the Medunsa Department of Nursing where every bed is occupied by a dummy patient. Only the heads show above the blankets. Mokoena passes from bed to bed, explaining how the dummies are used. Here’s one with a colostomy in the lower stomach, and another with a tracheotomy in the throat. Other dummies have surgical incisions with
Women of the lamp
NURSING AT THE ACADEMIC LEVEL

notably the diploma in Nursing Education, which
finally (in 1990) led to her appointment to the
teaching staff there.

‘Medunsa has offered me a great many
opportunities to teach – and to publish,’ she says,
showing copies of Practical Nursing Manual and other
textbooks that she has co-authored. ‘And, by the way,’
she adds with a smile, ‘one of my sons has become a
lawyer. So we’ve kept it in the family.’

Vereeniging-born Van Aswegen took a diploma in
Social Work before turning to nursing. Early in her
life, her brother became sick and then tragically died,
and ‘it was this experience that motivated me’. After
training at Tygerberg in the Western Cape, and
adding midwifery and psychiatry while nursing at
various institutions in Pretoria, she took her BA Cur
degree through Unisa while working at HF Verwoerd,
Pretoria’s major academic hospital. Her masters
followed in 1990 and finally her doctorate eight years
later.

‘I had never intended to follow an academic path,’
Van Aswegen says, ‘but in 1989 I was approached by
Professor Kitty van Niekerk, the then HOD of nursing
at Medunsa, and I took the plunge. I must say, I’ve
never been sorry.’

The result of this plunge today is a department of
25 full-time staff who Van Aswegen has moulded into
a highly committed team. ‘We’ve told you how we
painted our buildings ourselves. We organised music
and a braai, and everyone one came – including
friends from 3M company, one of our suppliers – and
by the evening the whole job was done.’

It’s heartening news in a world that often seems too
fast for anything but out and out self-interest. Perhaps
it should be put down to the nurturing spirit of the
original Lady of the lamp – and all the many
thousands of women that have followed after her.
Perhaps, deep down, it has something in common with
the subject of Joyce Mokoena’s doctoral thesis: human
rights in the health professions, and the search for a
common ethos to be infused into all health and
medical curricula.
THE ROLE OF NURSES IN THE COMMUNITIES

MEET Rambelani Malema, the Acting Head of the Department of Nursing on the Turfloop Campus of the University of Limpopo. She grew up in Limpopo’s huge rural hinterland, only moving closer to Polokwane to complete her schooling in a senior school not far from Seshego.

Not surprising then that her focus is on nursing in the hundreds of remote rural communities that characterise not only Limpopo province, but much of southern Africa as well.

After completing her basic training at Vereeniging and her midwifery at Baragwanath, she came to Turfloop to do a B Cur (LetA) degree, majoring in community health nursing, nursing education, administration and psychology. An honours degree followed at Medunsa, and then an MSc in Community Health at the University of Pretoria.

‘I’m currently working on my doctorate – which I’m hoping to complete in 2007 – and my dissertation is on the prevention of mother to child transmission of HIV,’ Malema says. ‘Yes, I’m deeply interested in the function of the nurse in rural communities. Yes, it is something I have carried in me ever since a child. I was attracted to nursing because I think I am a very caring person. I have always wanted to help; and the need for well-trained nurses in the rural communities, where their help is greatly needed, is central to my approach to nursing education.’

Like her colleagues at Medunsa, Malema reiterates the need for hospital-based training for nurses. ‘This is an absolute must,’ she says. ‘Just think of two examples: diabetes and head wounds. Without hospital training in these areas, the nurse in the community wouldn’t know where to begin.’

Coupled with this consideration is the shortage of nurses in the rural clinics far from hospital services. ‘Despite the introduction of the community health workers who are doing a fantastic job, the trained nurse needs to be much more than a nurse caring for the sick,’ Malema observes.

‘On a daily basis she is confronted with complex social problems: poverty, hunger, high levels of violence, malnourished children, abused children and neglected elderly. The nurse must be everything: social worker, someone doing the preventive and promotive aspects of primary health care, someone who follows up on treatments, and someone with enough time to talk to her patients. I mean, really talk so as to try to understand the root causes of disease and ill-health in the remotest communities. In short, nursing at its best is this incredibly holistic profession: being all things to all people in need.’
OF THE JUST UNDER 200 000 NURSES IN SOUTH AFRICA, NEARLY 14 000 ARE MALE. The figures for the province of Limpopo show a slightly higher male percentage. Of the province’s 17 000 nurses, 1 700 are men. That’s 10% of course – and the figures are rising.

At the Sovenga campus of the Limpopo College of Nursing, for example, intake statistics for 2007 show that just over 30% of the 300 students enrolled on the campus will be male this year.

The vice-principal in charge at Sovenga, Ephraim Mafalo, says that these increases are likely to continue in the light of the substantial shortage of nurses in the country. ‘Let’s look at the figures more closely,’ he suggests.

OVERALL NURSING STATISTICS DIFFERENTIATE BETWEEN REGISTERED, ENROLLED AND AUXILIARY NURSES. Latest figures from the South African Nursing Council are 101 295 registered, 39 305 enrolled, and 56 314 auxiliaries, giving a total of 196 914. The World Health Organisation (WHO) estimates that for developing countries the ratio of registered nurse to population should be 1:500. South Africa’s ratio (based on a total population of 47 000 000) is just below that figure. But the South African Department of Health wants to reduce the national ratio to 1:340.

‘That’s why,’ explains Mafalo, ‘there’s a call for an increase in total nurse numbers of between 30 and 40 percent. The provincial situation is much worse. Our registered nurse to population ratio in Limpopo is
1:732. In fact, we need to double our number of registered nurses from 6,000 to 12,000,' he says, adding that the situation is exacerbated by a provincial population growth rate of 2%, and a sizeable nurse drain into the private sector and abroad. ‘Will we ever catch up?’ he asks.

Plans are well advanced for adding a fourth and fifth campus to those already existing in the province at Sovenga, Giyani and Thohoyandou. The new campuses will be housed in prefabs while the new facilities are being built at the Jane Furse hospital in Sekhukhuneland and Mokopane Hospital in Waterberg District. In terms of the declared nurse shortage, the two new campuses are a start, Mafalo admits. But a great deal more will be required, not least transference of at least some of the training from hospitals to clinics and from there into the community itself by way of the traditional midwife in the rural villages, for example.

Mafalo has a deep-seated loyalty to the profession he entered as a young man in 1975. On the walls of his office are several framed documents that emanate from DENOSA (the Democratic Nursing Organisation of South Africa), an organisation he has headed as national president since 2002. ‘I’m in my second four-year term,’ he admits modestly. ‘But I began at the bottom: I began at shop-steward level. I have been involved for over thirty years with DENOSA, and my association with this organisation gives me genuine pride. I believe in the integrity of my nursing profession’.

Asked why he had chosen nursing as a career, he replies: ‘I wanted to become a doctor, but my mathematics probably wasn’t good enough, and anyway my family couldn’t afford the training. So I chose nursing. Yes, it was unusual for a man in those days. When I started my training – at Groothoek in Lebowa-Kgomo – there were only two men in that year’s intake. I knew I was crossing the hard line of tradition. It was a mountainous crossing. But I’ve never regretted it.’

After his basic training and his specialisation in psychiatric nursing, Mafalo completed a B Cur degree (Bachelor of Curationis) with Unisa, and then went on to add an honours to his qualifications as well as M Cur degree with University of KwaZulu Natal in 1997.

Mafalo’s ‘mountainous crossing’ refers to his entry as a male into a female-dominated profession. He notes with satisfaction the rising number of males who are now following his lead. ‘The demands on nurses in our modern world, especially in our largely rural province where so many people are uneducated and living in poverty, are massive. So it’s right that young men should stand shoulder to shoulder with young women.

‘I have huge respect for women,’ he adds. ‘For 32 years I have worked with women. Look, they are different people. My experience is that they talk a lot, but they also understand. They are quick-witted and hard working. They are very nice; and, above all, their hearts are so compassionate.’

This is high praise indeed for the women of the lamp in South Africa, and particularly in Limpopo.
The Materials Modelling Centre was established a decade ago with the support of the NRF, The Royal Society, CSIR and Eskom, while several other organisations came on board later. In computational modelling of materials, advanced computers and special softwares are used to predict properties of and uses for new materials applicable in the energy, manufacturing, transportation and minerals sectors, before they are made physically in laboratories. This approach has significant cost-reduction and safety benefits in industries and predictions.

The Materials Modeling Centre at Turfloop is one of the leading centres in the country. 'Our links as a flagship project into the new Centre for High Performance Computing is extremely good news for us,' explains Ngoepe. 'We’ll be able to use the high-powered computers being installed there for some of our more advanced large-scale modeling projects. Before, these computations were undertaken in Britain, courtesy of Cambridge and Cranfield universities’ High Performance Computing Centres, and the Royal Society.'

Ngoepe has done a lot more than make major contributions to the science of materials modelling, particularly in the fields of platinum group metals processing and alloys, and also in energy storage (battery) technology. In 2005, he was a finalist in the National Science and Technology Forum (NSTF) - Eskom Research and Capacity Development Award, given to individuals in South Africa who have made outstanding contributions to the successful training and mentoring of black researchers and students in science, engineering and technology over the past five to ten years. In the same year he won the NSTF TW Kambule NRF Research Award, which is made to black South Africans who have achieved outstanding contributions to science, engineering and technology, and who are seen as role models for others to follow. His former students nominated him for this award. And in 2006, he received an award from the Premier of Limpopo in recognition of his 'selfless contribution.
towards nation building and development of the people’. Several of his PhD students have also won national awards for their postgraduate work.

Even more important, however, has been his contribution to science and technology policy at the highest level. His participation on a host of local and international scientific committees, editorial boards, and science policy forums seems beyond the capabilities of a single man. He is still the chairperson of South Africa’s Council for Geosciences, and serves on the boards of the NRF, MINTEK, Eskom Research Advisory Board, and HESA Research Committee. He has been member of working groups for development of national strategies, such as nanotechnology, advanced manufacturing, hydrogen economy, energy research, and has helped the Limpopo Province with its mining development strategy. In these various capacities, he and other stakeholders, have been and are still canvassing endlessly for greater resources for science research and innovation.
Our arguments were always based on the question: how does science and technology advance the country and the continent? First World economy countries have demonstrated that there are direct links between science and technology investment and poverty alleviation, job creation and sustainable economic growth. Our own government has been positively influenced by these trends, and has increased the percentage of the GDP spent on science and technology research.

Another situation that Ngoepe and the University of Limpopo have taken full advantage of has been the shift in attitude of the developed world.

When we started to collaborate with the UK scientists, with the support of The Royal Society, ten years ago, Ngoepe recalls, ‘we soon realised The Royal Society were breaking with a 350-year tradition of matching excellence only to equivalent excellence. By co-operating with us and other historically disadvantaged institutions they were, for the first time, bringing their excellence to bear on capacity building. We grabbed the opportunity to strengthen our research base and to extend the scope of modelling applications. The collaboration was a good experience and mutually beneficial for all parties involved. We are currently working with institutions in the United States, Europe and the Far East; and the model of collaboration is being extended into other parts of Africa.’

In January and February 2006 Ngoepe participated in workshops organised by The Royal Society in Ghana and the UK that dealt with capacity building in Africa.

‘There’s very definitely been a change of heart,’ he continues. ‘The G8 has turned its attention to eradicating poverty by writing off some of Africa’s extensive debts. Coupled with that the G8 + four science academies have been developing plans towards capacity building in science and technology for developing countries, aimed at sustaining economic growth. The ministries of Science and Technology, on the African continent, are seriously contemplating harnessing these benefits by beginning to set aside resources for the development of science infrastructure.’

But if you think that Ngoepe has swopped hard science for the manoeuvrings of science as a socio-economic and socio-political tool, you’d be mistaken. In spite of everything he’s done, and is doing, he continues to make major contributions as a research physicist. Consider the following information from his lengthy CV. He’s published numerous articles in international journals; he’s given ordinary and invited scientific lectures at local and international conferences and he and his colleagues have hosted local and international conferences, workshops and summer schools in computational modelling of materials.

The unmistakable picture that is built up is of a man who knows his stuff, and who is willing and able to use it in the service of his university, his province, his country, and his continent.
A VARIETY OF STATE-OF-THE-ART COMPUTATIONAL MODELLING TECHNIQUES ARE APPLIED TO ENERGY STORAGE DEVICES, MINERALS, METAL ALLOYS AND POLYMERS. The hi-tech modelling procedures have helped towards understanding the properties of platinum-based and other alloys, as well as the complex processes relating to platinum group metals separation and beneficiation. The centre’s philosophy is to follow the current trend of modelling across length and time scales, a procedure that involves feeding information from quantum mechanical to classical scales, as well as to mesoscopic and macroscopic scales, and studying the exchange of information between these layers.

Director Professor Phuti Ngoepe emphasises that although the centre is in the international vanguard of computer modelling, the research undertaken there is directly relevant to its socio-economic environment. Our research into and around platinum is directly related to the exploitation of our own mineral resources here in Limpopo, says Ngoepe, and the energy storage side could have huge implications for improved storage of solar energy in our largely rural province, and for the development of electric vehicles. There’s also the more specific research we’re doing into batteries that will ultimately feed into South Africa’s electric car project which is in its second year.

According to the motivation for the research Chair now held by Ngoepe, the computational modelling capacity built at the University of Limpopo in the last decade, has positioned the centre to be a meaningful player in this field which is rapidly unfolding across many scientific disciplines internationally. It has also developed a basis for comprehensive training of postgraduate students, with more than 25 students having completed master’s and doctoral studies.
HE DOESN'T MINCE HIS WORDS. He's always saying forthright things. Listen. 'Blaming others makes you weak,' he says. 'Arrogance blinds people.'

‘A shared vision is not simply agreeing on a vision, it's learning to work together.’ ‘Many people are so worried about the past, in case they are judged outside their historical context; actually we should be much more worried about the future.’ ‘The way forward lies more in listening and working than in talking.’

And what about this one? ‘It's handy being called “doctor”.’ Dr Chris White. People think I know a lot. Actually I don't know all that much at all. I'm constantly finding out things from other people.’

He's a high-energy man who's not particularly interested in giving much biographical detail. ‘Born in USA of South African parents,’ he says, waving his hand. ‘They were Christian missionaries in Zimbabwe. Then we came back to South Africa. I went to Capricorn High School in Polokwane. My father taught me to be a carpenter. I did a lot of studying on my own. I clocked 160 000 kilometres on my motorbike. When I finally got to university I wore a tie and called the professors “oom”.’

Limpopo Leader wanted to interview him because of his joint affiliations to the university at Turfloop and to provincial government. White did his doctorate through Unisa, but his dissertation subject was the University of the North (now Limpopo), where he worked. His book From Despair to Hope: the Turfloop Experience, published 10 years ago now, is testimony to this. By then, he had turned his attention to ‘getting it all to happen’ at the university’s Turfloop Graduate School of Leadership that had been established at Edupark. But with the turn of the century, came a new focus – this time inside Limpopo’s provincial government. White, now 46, became Head of Support for the Premier and Cabinet of the province.

‘Yes, absolutely,’ he says, ‘both the university and government of this province have similar challenges
and a shared responsibility towards the people of Limpopo. Both the university and government need to become more hands-on and relevant. We need to get closer to the environment and communities we profess to serve. And we need to refrain from being institutions in service of ourselves. We need to support each other, encourage each other, and above all be honest to ourselves, and to each other.’

Forthright words, certainly, and underlying them is this fundamental admission: ‘Yes, there is clearly a need for a closer working relationship between the university and the government in leading and supporting development throughout the heartland of southern Africa. Make no mistake about this: we have much to offer. The question is how we put it all together.’

White makes special reference to Limpopo’s Provincial Growth and Development Strategy (LGDS). In Limpopo Leader 4 this strategy was explained in some detail, and some of the synergies between the provincial government and the university explored. But White’s concerns go deeper than these occasional arrangements of mutual benefit. He insists that the university and the government should ‘hold hands in striving to attain the objectives of the LGDS’. But there are impediments to this organic kind of partnership.

‘Both the government and the university have a leadership responsibility and similar internal leadership challenges,’ he suggests. ‘By this I do not mean anything to do with ‘the leader’ - either the Premier or the Vice-Chancellor. The challenge relates rather to how we perceive leadership in relation to our various roles in service to the people of Limpopo. There is a need to move away from the obsession to control. Instead, both government and university must strive to create an enabling environment for civil servants and academics to emerge from their silos and move towards integration and co-operation both inside the various institutions, but also between the institutions themselves. And we must not only communicate in meetings.'
But we need to be very sure why we are doing this,’ says White. ‘The need is for a truly shared vision, and the continuous building of relationships and the sharing of good local information. All too often both the university and the government run elsewhere for the answer to our numerous challenges, when many of the answers, and much of the expertise, lies at our doorstep here in our province. We need to recognise and use what we have, before we go elsewhere – not vice versa.’

White acknowledges that the potential of Limpopo as a southern African leader is enormous. But he sees ‘an inner-directed, closed approach by many within government and academia’ to be a major stumbling block. Cultivating the right attitude will be a key factor.

‘Essentially it is a challenge of purpose. What are we here for? For our own careers or for the people of the province and the region? We need to move away from a culture of blame and self-centredness, and get more firmly onto a path of service. We call ourselves public servants, and in the university we talk about the sharing of knowledge. The language is accurate. But in practice we spend a lot of time deluding ourselves about how we measure up to the imperatives of serving and sharing while the centre of our endeavours relates more to striving to further our positions in the bureaucracy or flaunting our degrees. We need, as public servants and as academics to understand that we are a small part of the greater provincial whole. We need to be more responsible about the true nature of our contributions. The community looks up to both the government and the university, and both institutions need to set an example.’

White attempts to sum up. It is the need to work more closely together, and the need for individuals in both the university and government to understand their serving and sharing roles, that if responded to could send Limpopo soaring into the exhilarating air of mounting success. But what if the response is inadequate?

White stares out into the Haenertsburg forests where he lives. ‘Sometimes when I try to look at the future, a fear comes over me. Who are we going to blame next when our wealth gets taken from us, and when we have a province full of exhausted mining holes and the shacks of the unemployed?’

But the mood does not linger. He laughs. ‘I know that it will be the small things, the simple linkages between people and institutions, that will help to shape our future for the better. Then I feel encouraged. I go for a swim in the dam. I prepare to run another Comrades Marathon. I play a few hymns on my trumpet. And then I feel ready to go on working for this brilliant province that I call home.’
LETTERS TO THE EDITOR

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