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Enigmatic death of Oscar Wilde's wife explained

29 January 2015

For over a century the sudden death of Constance Wilde, wife of the famous author and playwright Oscar Wilde, has remained a mystery. Now, thanks to medical sleuthing by retired UCT academic and psychiatrist Dr Ashley Robins and Wilde's grandson, Merlin Holland, the cause of Constance's death may finally have been determined.

Constance and her son, Cyril Wilde.

Constance Wilde died suddenly in Genoa, Italy on 7 April 1898, from complications following surgery for the removal of a uterine fibroid. She was 40 years old. These facts, however, describe only a small part of the circumstances that surrounded her death.

Constance had fled to Genoa to escape the scandal and spectacular fall from grace of her husband, who in 1895 had been found guilty of the crime of being homosexual. She found herself in a foreign city, with two young sons, having abandoned her career as a children's author and her role as a suffragette.

'Pelvic madness'

In addition, she was plagued by mysterious physical symptoms such as facial paralysis, exhaustion, pain and an inability to walk – symptoms that many doctors had tried unsuccessfully to treat.
Enter the urbane and seemingly knowledgeable high-society Italian gynaecologist, Luigi Maria Bossi, who claimed he had a cure.

Dr Ashley Robins, a retired UCT academic and psychiatrist who spent time reviewing old correspondence and documentation together with the Wilde's grandson, Merlin Holland, posits that Constance consented to undergo surgery with Bossi, believing a cure was possible. "Bossi was fond of diagnosing his patients with conditions such as 'pelvic madness', believing that all neurological illness in women stemmed from their reproductive organs, even though at the time such diagnoses were already discredited," says Robins. "It is likely that Constance died of blood poisoning or an obstructed intestine, either of which could have been brought about by the operation."

Although at the time Bossi did not suffer any consequences for the botched surgery, he was later penalised for his archaic medical beliefs with a two-year suspension from his professorship at Genoa University, before being fatally shot by one of his patients' husbands.

**Nine-year illness**

According to Robins' and Holland's re-examination of the correspondence between Constance and her brother, she first started displaying symptoms almost a decade before her death.

Their recently published Lancet study states: "Her nine-year illness was characterised by widespread pains, right-leg weakness, tremor of the right arm, profound fatigue, and a left facial paralysis ... For the first seven years the clinical picture was dominated by intermittent acute episodes, followed by extended periods of recovery; in the last two years her disability became permanent, with gradual deterioration. A likely diagnosis is multiple sclerosis of the relapsing-remitting type, which subsequently developed into secondary progressive multiple sclerosis."

This debilitating neurological condition is thought to be triggered by the degeneration of myelin, a substance that protects nerve fibres from damage. Although the illness was first described by Jean-Martin Charcot in 1868, physicians may not have associated Constance's symptoms with the then relatively recently identified disease.

What prompted Robins and Holland to re-examine the 117-year-old letters?

For Robins, it comes down to a lifelong fascination with Oscar Wilde. "My mother would read me Wilde's fairy tales as a child, but she would never explain how he died. I became fascinated by him, his wit, and his larger-than-life personality."

In 2000, the centenary of Oscar Wilde's death, Robins played a part in the discovery that he had died from meningitis brought on by ear surgery, rather than from syphilis, as had been speculated. In 2011 Robins also
published a book analysing Wilde's personality and retrospectively diagnosing him with hysterical personality disorder.

**Premature deaths**

Merlin Holland had a more personal reason to investigate the cause of his grandmother's death. While his mother was alive, she had worried that revealing the contents of the letters would encourage people to sensationalise Constance's life and death. With this new discovery, however, previous ideas that her death had been caused by a fall, poisoning, or syphilis contracted from Oscar have all been proven untrue.

"I rather feel this will put Constance to rest, poor thing," he says.

Almost 120 years after their deaths, we now know that Oscar and Constance died from completely unrelated medical conditions. Nonetheless their deaths share common, tragic elements.

They both died young, and from possibly avoidable medical conditions that today might be treated successfully. In both their cases, the more indirect causes of their premature deaths can be related to the prevailing social attitudes of the day.

For Oscar, prejudice against homosexuality led to his incarceration and physical decline, while Constance suffered the consequences of being a woman at a time when the medical fraternity tended to blame neurological conditions on female physiology.

"Tragically, if Constance had been alive today, there would have been every chance that her condition, while incurable, could have been diagnosed and treated," says Robins. "I would like to believe that medicine, the very discipline that failed her then, has also played a part in uncovering the truth behind both their deaths."

*Story by Ambre Nicolson. Image of Constance and Cyril Wilde courtesy of Wikimedia Commons.*
Student research is changing the way rugby is played around the world

19 January 2015

Few are able to say they have helped to change the way rugby is played around the world, but this is something University of Cape Town PhD graduate James Craig Brown can claim with confidence.

Dr Brown’s thesis evaluates the effectiveness of the BokSmart programme, a nationwide injury-prevention programme for rugby launched in 2009 by the South African Rugby Union (SARU). Ultimately, the programme aims to reduce the incidence of rugby-related catastrophic head and neck injuries in South Africa.

Through his research, Dr Brown (who graduated with a PhD in December 2014) found that the scrum engagement sequence in rugby was dangerous and needed to be adapted to increase the safety of the players. Dr Brown’s research helped to contribute to a new ‘crouch, bind, set’ sequence in rugby when setting the scrum, as opposed to the previous ‘crouch, touch, set’ sequence.

The ‘crouch, bind, set’ engagement sequence requires props and hookers, who comprise the first row in a scrum, to bind onto (instead of simply touching) their opponents, after the referee has called “bind”.
The front rows maintain the bind until the referee calls "set", when the packs engage – or more accurately, collide. The "bind" stipulation means that opposing packs hit each other from a shorter distance than before, thereby probably decreasing chances of traumatic neck injuries.

SARU first announced this change at the school and amateur rugby level in 2013.

"The rest of the world followed SARU's lead six months later," says Dr Brown.

**Minimum safety standards**

Based on Brown and his team's identification of the most common injuries at the annual SARU youth weeks, the SARU medical department also drafted a 'minimum safety standards' document to make medical support teams aware of the most likely injuries, and how many they may need to deal with in a day.

"Together with SARU's medical department, we developed a general rule to allocate the number of medical doctors to tournaments based on the number of serious injuries per match. These seemed to increase with the age of the attendees at the tournament, so that the under-13 tournament had the least serious injuries, and the under-18s had the most serious."

Dr Brown's research found that after its launch, BokSmart was able to reduce catastrophic injuries in junior (schoolboy) but not senior (adult) players. The study also found that player behaviour had improved over this period. However, Dr Brown said that although there was a widespread positive response towards the programme, some coaches from high socioeconomic-status teams felt that the programme was a waste of time, as they perceived the risk of catastrophic injury to their teams to be negligible.

Having played rugby all his life, Dr Brown says he has a "huge passion for the game".

Wanting to complete a PhD that not only provided novel information to the world, but also had a direct application and improved rugby player safety led Dr Brown to his thesis: Safer rugby through BokSmart? Evaluation of a nationwide injury prevention programme for rugby union in South Africa. The thesis evaluation uses both quantitative and qualitative methods to investigate not only catastrophic injury rates over time, but also player behaviour and coach and referee perceptions of the programme.

Dr Brown obtained his BSc in Biochemistry and Physiology before obtaining his BSc (Med) (Hons) and MSc (Med) in Exercise Science from UCT. His PhD thesis was a joint project between UCT and VU University in Amsterdam, The Netherlands.

Dr Brown graduated on 20 December 2014, with a doctorate in Exercise Science from UCT’s Science faculty.

*Media release issued by Kemantha Govender, UCT Communication and Marketing Department.*
How can we prepare nurses to deal with death and dying?

29 January 2015

A new course is needed in the nursing curriculum to help nurses prepare for the reality of patients who die under their care, new research reveals.

"The mother is so angry (black hearted) and the doctor's hands are tied as there is nothing more that can be done to save this baby. I am in the middle feeling lost, hopeless and useless." Often, in the ICU, nurses don't have time to say goodbye to a baby, says Fouché.

Nurses, particularly those working in critical-care units, are under considerable pressure. Despite critical-care staff being highly trained and skilled, there is high staff turnover, particularly in paediatric critical-care units. Nicola Fouché, a PhD graduate, investigated the reasons why.

"Departing staff often give, as reasons for leaving, the emotional burnout they suffer as a result of the clash of priorities they face, the concern of critical-care units to preserve life at all costs, and the personal need of nurses to manage their human contact with dying patients," says Fouché.

Fouché says students studying towards the Postgraduate Diploma in Nursing (Critical Care Adult and Child) at UCT express considerable unease when confronted with discussions about death.
During research for her thesis, entitled, "We Don't Handle Death Well": Implications for a Postgraduate Nursing Curriculum of Intensive Care Nurses' Experience of Death in ICU, Fouché spent many hours with six nurses who work mainly in paediatric critical care. She said the nurses were asked to draw pictures of their experiences with death. They later talked about them.

"Their sadness was palpable," says Fouché. "Often, in ICU, you don't have time to say goodbye to a baby. A course won't stop the burnout and stress, but it may allow nurses the space to understand and grieve."

A course would also help nurses to understand and respect the way different cultures and religions deal with dying and death.

"Being with someone in their last days of living is a privilege. You can make that death a very significant goodbye for the family as well as for yourself," says Fouché.

Fouché, an experienced critical-care nurse, convenes the UCT Postgraduate Diploma in Nursing (Critical Care Nursing). She holds an MSc (Nursing), an Advanced University Diploma in Nursing Education and a Diploma in Intensive Nursing Science from UCT. Her doctoral research was supervised by Dr Kevin Williams from the Higher and Adult Education Development and Studies Unit in the Faculty of the Humanities. Fouché graduated with a PhD from UCT on 16 December 2014.

Story by Kim Cloete.
Time–lapse photos show dramatic environmental change

29 January 2015

Before–and–after photos show how climate change is affecting South Africa. From these pictures, researchers are making predictions about other regions. But can anything still be done about it?

South of Touwsberg in the semi–desert Karoo landscape, the vegetation is changing slowly. In the past 100 years it has become somewhat greener.

Timm Hoffman's work is a bit like a treasure hunt – with handwritten instructions: “Drive 40 miles south from the post office, and then ten miles east in the valley.”

Such are the signposts that Hoffman follows to find a specific place somewhere in South Africa – down to the nearest metre. What guides him are old photos, some of which have been taken more than 100 years ago. Sometimes Hoffman is lucky, and the photographer has written the location on the back of the photo. At other times, he can only guess.

For Hoffman, though, it's precisely about that: finding the exact same perspective to repeat the snapshot. And that's the reason for the journey – to be able, later, to put both images side by side, and see at a glance how nature has changed over the decades.
South Africa is a country that is being particularly badly affected by global change – both in climate and in land use. In order to document and understand the practical consequences, Prof Timm Hoffman of the University of Cape Town (UCT) travels with his students throughout the country.

The landscape photos that they take, matching the old pictures, show the changes that have taken place over time.

The photos of some regions are alarming, and the difference between the old and new photos serves as a warning for the future. The looming dangers are water shortages, loss of biodiversity, and the loss of open savannah landscapes.

The biggest changes are in the landscape of eastern South Africa. What was once open landscape is now overgrown. The forest is taking over the bush and savannah. The animals that live there, such as zebras, giraffes, wildebeest and leopard, are losing land. Farmable land is also becoming smaller.

**Animals in Kruger National Park push back trees**

The only region in South Africa where the spread of trees is still being held back is in the Kruger National Park, Hoffman says, explaining that it is thanks to big animals pushing back trees and shrubs. Anyone who has ever gone on a safari in the park will have seen numerous trees that have been bent like matchsticks and destroyed by elephants.

However, if the population of elephants – for whatever reason – should decline significantly, large parts of the Kruger Park would become more wooded.

The increase of woodlands in South Africa is not only the result of climate change and an increased concentration of carbon dioxide in the atmosphere: due to the increased fragmentation of the landscape, fires cannot easily spread over large areas. They are stopped by the roads. Previously, a fire could destroy much larger areas of woodland. There is a controversial viewpoint that humans should perhaps intervene by artificially starting fires in order to regulate the ecosystem.
Situated about 250km north of Cape Town is the Bulshoek Dam, a former irrigation canal. Today there are man-high bushes and trees, including many alien species.

"The diversity of species will decline," says Hoffman. "This will not only concern the bigger animals in the open grasslands, but also the birds and insects." The sprawling woodlands will also displace many types of plants. Hoffman's assessment: "The environmental changes documented by our photos can be dramatic."

Hoffman started his photo comparisons project 25 years ago. "I now have a collection of more than 20 000 historic landscape pics," the botanist says.

And in the case of at least 1 500 photos, Hoffman and his team have succeeded in taking current photos that are almost identical to those in the archives.

**Three cameras on the job**

Since the 19th century, photos have been used by scientists for documentation. At that time, botanists and ecologists used the fledgling technology to capture and map the rich flora of South Africa and Namibia.

Over the years, geologists – searching for valuable mineral deposits – forest researchers, hikers and various amateur photographers have also built up numerous landscape collections, which they have now donated to
science: "I have some great pics here, would you like them?" Timm Hoffman also receives such offers from private individuals, when they hear about his extraordinary research project.

The oldest image in Hoffman's collection dates from 1876 and shows a landscape in Namibia. Until the 1950s, mainly black–and–white images were produced; thereafter, primarily slides.

Hoffman still goes into the field with three cameras. For black and white photos he uses a Japanese Mamiya 645 – a medium–format camera that is also used by advertising and fashion photographers. For colour photos, the researcher uses a Minolta SLR (single–lens reflex) camera.

For the analytical work on a computer, digital images are also needed. For this purpose, Hoffman uses a Canon 5D Mark II, with 23 megapixels of memory. "I use all three cameras, to take about 10 to 20 photos from one position," says Hoffman.

To find this position is not an easy task. Many of the historic photos don't include directions. In those cases, Hoffman can only orientate himself by the use of characteristic landscape features such as mountain ranges.

The final task – to find the exact position from where the photo was originally taken – is still a huge challenge.

The photographing is of course only one aspect of the work, Hoffman stresses. Before each photo, he walks carefully through the area to examine the ecological situation. Which plant species are represented here? Which of them are invasive species? How close is the growth? All these things are noted in detail in Hoffman's 'lab notebook'. These notes, together with the before–and–after images, are the foundation of his interpretation of the differences in vegetation.

**Stable deserts in the west of the country**

"The changes are enormous," reports Timm Hoffman of the work done to date. There is no uniform trend – climate change impacts the different regions of South Africa very differently.

The deserts in the west of the country are stable. On comparing old and new pictures here, you can only see a few differences. A look at the eastern edge of the desert, however, does reveal change. Here, grasslands invade desert areas. The desert retreats.
Near the village of Gawukeni, in the south-east of South Africa, bushes, trees and aloes are taking over the landscape.

According to Hoffman, this is unique in the world. Globally, desert surfaces are increasing; and consequently, experts have predicted that in South Africa, the deserts would also push back the grasslands. Hoffman’s photos, however, show the opposite.

This South African exception could be explained by the increase in rain during springtime, which promotes grass cover and its expansion to the west: “The increased concentration of carbon dioxide (which acts as a plant fertiliser) certainly also plays a role.”

The speed at which the vegetation in South Africa could change has also been investigated by Simon Scheiter of the Senckenberg Nature Research Society in Frankfurt am Main, with Steven Higgins of the University of Frankfurt. With the help of computer models, they discovered that the increase of carbon dioxide in the atmosphere could lead to sudden changes in South African vegetation – for example, when an open savannah with few trees becomes a dense forest.

"We are dealing with a bistable ecosystem," Scheiter explains. The transition from the one landscape to the other could take place within only 10 to 20 years.
Forests in Australia are spreading

The mechanism of bistability is simple: more carbon dioxide, higher temperatures and more rainfall promote the growth of trees. They rob the grass of light, and thus reduce its chances of survival. In the end, there is only dense forest everywhere.

This is true not only for South Africa. Scheiter has also used his model to calculate the changes in vegetation in Australia. The result: it appears forests are also on the rise in Australia.

But is the spread of forests not a good thing? Isn’t it always lamented that too many trees are being cut down? Are forests not a major reservoir for atmospheric carbon dioxide?

Both Simon Scheiter and Timm Hoffman are very sceptical. It is true that the expanding forests absorb more carbon dioxide; however, this effect will not be able to stop the overall increase in both carbon dioxide and climate change. “I expect only a small braking effect,” says Scheiter. The ecological disadvantages of forestation are far worse. This is confirmed by Hoffman.

The ongoing climate change also threatens the biodiversity of South Africa for another reason. Some alien species are displacing native plants, because they are adapting better to the new environmental conditions. This is especially true for the fast–growing trees that were brought to South Africa from Australia.

The different types of eucalyptus trees have become particularly problematic – they are not only spreading out rapidly, but also consuming a lot of water. The water they extract from the ground is taken away from other plants, and from farming. In addition to these Australian imports, the pine trees that were originally brought to South Africa from Europe are also a cause of great concern to ecologists.

Agriculture (including the production of wine) is, after mining, the second largest contributor to the gross domestic product of South Africa. The looming shortage of water is therefore a highly explosive topic. Many of the research projects that focus on the effects of climate change are being financed by funders who mainly focus on the study of sensitive water management.

Fighting alien plants with physics and chemistry

The government is doing something – it is fighting the spread of alien plants with the help of physical and chemical methods. But success is only possible in small regions.
Sixty-four years ago a number of quiver trees grew on this gravel desert in Namaqualand in the Northern Cape, South Africa. Today, there are only a few trees left.

Another option being considered is to import specific pests from these alien plants' home countries, which could act as biological weapons and keep the plant populations in check. This approach, however, is controversial, as it is hard to assess what unwelcome side effects these pests could have on ecosystems.

Some researchers believe that climate change in southern Africa has also hit Hoffman’s favourite tree: the quiver tree (Aloe dichotoma), which grows up to nine metres tall. Its characteristic silhouette shapes parts of Namibia and the Northern Cape. A recent IUCN article lists Aloe dichotoma as a flagship climate-change species.

Hoffman believes that his photographic research can help predict the development of South Africa’s vegetation in the future. From developments to date it is possible to predict further trends. The more before–and–after photos there are, the more meaningful the interpretations and predictions will be.

The search for the correct photograph locations somewhere in the vast expanse of South Africa is a time– and labour–intensive exercise. Few researchers would be able to visit and retake Hoffman's 20 000 photographs, not even in decades. This type of research, however, is often interesting for amateur scientists, hikers and adventurers. When Hoffman noticed the great interest of many citizens in his research, he hit on the idea of including them in the project. These ‘citizen scientists’ enjoy going on expeditions as scientific scouts.
“Anyone who is interested is welcome to participate,” says Hoffman. He has created the rePhotoSA website for this purpose, where he has saved 5 000 landscape photos that are still awaiting current comparison photos. Amateur researchers don’t receive any payment, but have access to plenty of information about how to get started on the website.

Why not do something for science, if you are planning an outdoor holiday in an affected region anyway? This approach could give many a tourist an extraordinary perspective.

*Original story by Norbert Lossau, Head of Science, Die Welt, translated by Birgit Ottermann. This story originally appeared in Die Welt am Sonntag. Repeat photographs courtesy of Timm Hoffman.*
More than a gut feeling: the good and bad news about parasitic worms

29 January 2015

Around a billion people living in the developing regions of sub-Saharan Africa, Asia and the Americas are infected with at least one type of parasitic worm. These worms – including hookworms, roundworms and tapeworms – collectively known as helminths, cause some of the most common infections in the developing world. Strikingly, they have probably co-evolved with us for millions of years since we first stood upright, and so have helped define how our immune systems function. However, our relationship with these worms is poorly understood, and far from straightforward.

A section of a gravid (pregnant) female Nippostrongylus brasiliensis parasitic nematode.

On the one hand, helminths are disease-causing pathogens that directly contribute to significant illness, suffering and death in the developing world. On the other, immunological studies have found a range of potentially positive effects of helminth infections, including protecting against diseases such as diabetes, multiple sclerosis and respiratory disease. Therefore, the same infection has the potential to cause harm and
also do good. Dr William Horsnell and his team in the Institute for Infectious Diseases and Molecular Medicine (IDM) are trying to unravel the complex effects of helminth infections on our health.

Helminths: A vaccination saboteur?

A recent study led by Dr Horsnell and Professor Adam Cunningham (University of Birmingham, UK), and published in PLoS Neglected Tropical Diseases, has shown that exposure to helminths led to a strikingly reduced control of non-typhoidal Salmonella (NTS) infection, and also reduced the efficacy of a new vaccine candidate against these bacteria. NTS is a devastating disease that kills tens of thousands of children every year in sub-Saharan Africa. At this stage, no licensed vaccine exists for NTS: understanding how new vaccines against the infection may work is therefore an important research question.

The authors note that many vaccination studies have not addressed how an unrelated infection (such as a helminth) might alter how a vaccine will work, and how any such effect could be overcome. This is particularly important, as it appears helminths might affect the success of many different types of vaccines.

To understand how exposure to a helminth infection influences immunity to NTS infection, the researchers infected mice with both salmonella and helminths. Dr Saeeda Bobat, from the School of Immunity and Infection at the University of Birmingham, who performed the majority of these experiments, noticed that a major feature of the impaired immunity was a reduction in the level of antibodies against salmonella in helminth-infected mice. This suggested that a prior helminth infection could result in lower antibody responses after infection or vaccination. This was indeed the case. Helminth-infected mice that were vaccinated subsequently had up to a hundredfold more bacteria than vaccinated mice that hadn’t had a helminth infection. This suggests that vaccination might be less effective in populations that have more helminth infections. Fortunately, this study also showed that giving additional immunisations rescued antibody production, and protection could be restored. This will help plan how to use vaccines effectively in regions where helminths are prevalent.

What Bobat, Cunningham and Horsnell have shown in this study is that a helminth infection can have a dramatic effect on both the ability of the host to control an unrelated infection, and on the chances of a vaccine against that infection working. Importantly, the authors then go on to demonstrate that if health workers adapt their approach to vaccination, then helminth impairment of vaccine efficacy can be reduced. This discovery could have quite far-reaching consequences, because the age when children most commonly receive their vaccinations – at or before school – is also the age they are most likely to be infected with parasitic worms.

“This finding is particularly significant, as a greater understanding of the effect of helminths on immunity will help medical professionals to better understand how best to employ life-saving vaccines,” says Horsnell.

Might helminths help you breathe?

Yet interestingly, the relationship between helminths and immunity is not always a negative one. A number of studies have shown that helminth infections can protect against a number of autoimmune diseases, such as
inflammatory bowel disease, diabetes, allergy and respiratory infections. This appears to be achieved by the parasites inducing regulatory components of our immune system that prevent other damaging immune responses. As the majority of helminth infections we experience are harmless, it may be that the parasite induces these regulatory responses, so that our immune responses to them are weaker, thus allowing them to live in us. A beneficial side effect of this may be that these regulatory responses protect us from developing autoimmune diseases.

Horsnell's involvement in a separate study, RHINESSA (Respiratory Health in Northern Europe, Spain and Australia), has recently received World University Network (WUN) funds to explore the possible positive effects of helminth infections on allergy. This large collaborative study with (among others) Prof Cecilie Svanes (University of Bergen), Prof Vivi Schlunssen (Aarhus University) and Prof Rain Jogi (Tartu University) has been examining trans-generational effects on respiratory health in a study group, which has data and samples from as far back as 1940. One of the key outcomes of this study has been the high correlation between individuals who grew up on farms with low levels of allergy. This correlation, says Horsnell, may be related to increased exposure to helminth infections.

"We assume people in Europe no longer get a lot of helminth infections, which is probably true. But they may get more than we think, especially if they are living on a farm. Hopefully, this large-scale study will help to answer whether this exposure to helminths occurs, and more importantly, how it contributes to protection against allergy," he says.

Archaeological evidence has shown that helminths have infected humans for as far back as we can document: the eggs of intestinal helminths have been found in the mummified faeces of humans from thousands of years ago, and characteristic clinical features of helminth infections have also been identified in the writings of Hippocrates and in Egyptian medical papyri. Yet we still have a great deal to learn about the relationship parasitic worms have with us. What is apparent is that while helminth infections can make us ill, they can also have beneficial influences on our susceptibility to a range of important diseases. As scientists continue to grow their understanding of helminths, so the medical community can learn not only how better to protect us against the negative effects of parasitic worms, but also to understand how helminths can be used to protect us from disease.

Story by Natalie Simon. Image of helminths by Claire Hoving.
Can information and communication technology improve citizens’ well-being? Computer scientist and UCT doctoral fellow Omowunmi Isafiade was recently selected as one of eight sub-Saharan L’Oreal UNESCO Women in Science fellows for her work in developing a situation-recognition system to increase public safety.

Growing up in Nigeria, Omowunmi Isafiade didn’t consider computer science as a career choice. “At that time it was very expensive and scarce in my home country,” she explains. “Gradually, however, I realised that computer science is a field that is used in virtually every domain of life, from health to public safety to finance. Computer science steadily became my hobby, and my hope is that pursuing a degree in this field can provide me with the knowledge and skills required to bring changes to some of the challenges facing humanity.”

That hope was advanced when Isafiade was recently recognised as one of eight sub-Saharan L’Oreal UNESCO Women in Science fellows at an awards ceremony on 26 November 2014 in Johannesburg. The award recognises her work in improving crime data analysis so as to provide better information to public-safety authorities.

In essence, my research involves trying to improve statistical techniques used to mine crime data. For example, we were able to mine crime data and then actually highlight the locations of hotspots where crime is more prevalent,” says Isafiade. Her work is also aligned with the concept of the smart city, the idea that
information and communication technology can improve citizens' wellness. "I realised that safety is a key issue, because it's only when a city is safe that it can actually be smart. So now we talk about 'safe' and 'smart' cities and that is where safety comes in – my research is on the public-safety approach to the idea of the smart city."

The Women in Science awards aim to celebrate the scientific achievements of women around the world. Each year dozens of women from five geographical areas are honoured, and from these, five global laureates are chosen at an awards ceremony held in March. The L'Oreal Foundation started the awards in partnership with UNESCO, to celebrate women's scientific successes, focus attention on worthy areas of research and provide positive role models.

Isafiade agrees on the need to promote the idea of science as a relevant career choice for women. "I wouldn't have thought that five years ago I would have come this far, but because I've held onto my dreams, I keep on going with it. My advice to women interested in this field is to go for it. Pursue your dream. Be focused. And you can achieve whatever you want to achieve."

Isafiade will use the funds from the fellowship for her research and to purchase equipment – such as a laptop. "This award is so fantastic and motivating. I really look forward to using the money efficiently for my research work, and also to motivate myself in terms of how to gather information about data and get in touch with public safety authorities to get information on the state of crime."

*Story by Ambre Nicolson. Crime Scene image courtesy of Adam Gerard under Creative Commons Licence.*
Young green visionaries re-imagining the future of farming and industry

29 January 2015

Three UCT students were among 25 recipients of the Green Talents 2014 awards, internationally recognised prizes for young researchers focused on sustainability. The winners were chosen from among 800 applicants from more than 100 countries. It is the sixth time that these awards have taken place, under the patronage of the German Federal Ministry of Education and Research.

Smallholder farmers in Kenya.

nkulumo Zinyengere

Nkulumo Zinyengere, a 28-year-old PhD student from Zimbabwe, regards winning as an honour and a challenge: "What the award acknowledges is potential. I therefore feel challenged to live up to the recognition by translating this potential into an actual contribution towards sustainable improvements in agriculture and food security in the region."

Zinyengere studies the farming practices of smallholder farmers in Southern Africa, looking in particular at their potential to adapt crop production to climate change. He remains motivated by his research's "potential to provide insights into practices that could help promote food security in vulnerable farming communities".

"I am a strong believer in Africa feeding itself through innovation in agriculture, so for as long as I can work towards making a contribution to this, I will be satisfied."

His experience in Germany was eye-opening, with the highlight being the Falling Walls conference at which UCT doctoral graduate Dr Dyllon Randall won third place. "Here at Falling Walls some of the most innovative scientific ideas and breakthroughs by young scientists from all over the world are presented. As a believer in the idea of science in service to society, I was inspired by how young scientists are contributing to solving everyday life challenges."

**Melissa Sikosana**

The Green Talents 2014 judging panel was impressed by Melissa Sikosana's academic achievement so early on in life (she is only 26 years old) and her "efforts to link scientific solutions to societal innovations".

A final year MSc student in chemical engineering, Sikosana's research is focused on nutrient and energy recovery from sewage. "I have always been fascinated by centuries-old rural African practices, which are often basic and sustainable. I believe that sustainable solutions lie within communities themselves, and the real challenge in Africa is aligning these solutions in terms of health, safety and functionality; making them not only more efficient but more effective," she explains.

She also believes her achievement has put her home country, Zimbabwe, and UCT on the global scientific radar: "This achievement demonstrates that the face of scientific research is willing to change. My research is at the interface between social sciences and engineering, and I feared that it would not be well-received. It is encouraging to see that this unconventional (and very relevant) scientific research, promoted by my supervisor Professor Harro von Blottnitz, is making waves in the global sustainability scene."

The prize included a two-week tour through Germany, where the winners visited top German locations for sustainability research. Winners were also offered a research stay in Germany of up to three months in 2015.

"Meeting with industry experts opened the door for discussion and collaboration. It was also interesting to learn that many developing (and some developed) countries are experiencing similar sustainability issues; hence, collaboration and cross-continental exchange is essential. On a personal level, it was great to travel and meet people from different countries, as well as learning about their cultures and aspirations. It refreshed my perspective on my research, and has given me the confidence to continue to question the effectiveness of current scientific methods towards achieving sustainable development."

**LovanoMenjanahary (Lova) Marline**

LovanoMenjanahary (Lova) Marline (27) is one of the first scientists to embark on a comprehensive study of Madagascan bryophytes, small non-vascular plants such as mosses, liverworts and hornworts.
Marline, who is from Madagascar, a global biodiversity hotspot, is doing her PhD on these plants: "Bryophyte ecology is a dynamic field with much to offer to our better understanding the importance of local and landscape-level processes in controlling biodiversity. Climate is the ultimate driver of species distributions at large [regional and national] scales. Some traits of bryophytes might make them less vulnerable to change in temperature, but many species are likely to be substantially affected by changes in humidity-related parameters."

The jury commended her for showing "great initiative and [breaking] new ground in the study of tropical bryology in Madagascar, working under difficult research conditions and being awarded both national and international scholarships".

Marline found the interaction with other Green Talent winners enriching. "It was an incredible experience. I have created new collaborations with bryologists and German specialists from the different institutions I visited. We also developed a large network of international young researchers, and very good friendships."

*Compiled by Abigail Calata. Photo by McKay Savage from London, UK.*
Breaking the wall of wastewater

A UCT graduate and innovator presents his idea for making a profit out of wastewater, at the Falling Walls Lab competition in Berlin.

Watch the video here

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