Introduction:
My scholarship funded travels over the summer of 2017 were to South Africa. The aim of the trip was to examine certain facets of South African geology, and gain an insight into the culture and history of the nation. SA is very geologically rich, and as both a geology student and a lover of travel, this trip was to be extremely beneficial to me as it enabled me to get a sense of the sort of country my degree would allow me to work within; should I ever work abroad as I intend. I also got the opportunity to explore a wonderful country that was new to me.

My two-week visit was made possible by the kind generosity of Ede and Ravencroft and the University of Leicester, to whom have my sincere thanks for the trip of a lifetime. Special thanks are also due to Mr. and Mrs. Allen for their excellent hospitality during my stay.

The Journey:
I flew to Johannesburg in August, to meet my girlfriend with whose family I would be staying. Almost immediately after leaving the airport, we were briefly stopped at an armed police checkpoint due to criminal activity in the area. Certainly, I wasn’t in England anymore!

We decided to jump straight in, and went on an underground mine tour of the Premier Diamond Mine at Cullinan, birthplace of much of the British crown jewels.

On the surface tour before going underground they showed us the equipment that extracts a million tons of ore a year, and transports it almost a kilometre upwards to the surface. It was explained how they processed the kimberlite diamond ore, and how they separated the precious diamonds from the waste rock. We also got to see the exact location where the largest diamond ever was found, the Cullinan, a mere five feet from the surface. Even now, more large carat stones are found here than any other diamond mine in the world.

Now in a lift big enough for 120 people, we descended 763m below ground to the current working level of the mine. Here we saw an underground rail network for transporting the ore, crushers, workshops, offices, and refuge stations built for cave-ins and gas leaks, all hidden far below ground. One of the miners tearooms even had a fishtank and Christmas tree inside! It was good to see the high standards of health and safety for the staff at the mine, especially as this is the sort of environment I might find myself in in the future.
Next up was a visit to Orlando Towers, situated in the Soweto suburb of Johannesburg. Whilst en route I got my first glimpses at the corrugated tin shacks that house so many of the country’s 12 million people living in poverty. In a nation where the average wage is only £3,700, it is quite sobering to see the disparity of wealth throughout the population. Despite apartheid officially ending in 1994, it has left some deep scars that are visible to this day. However, poverty rates are declining, and government programs are educating and rehousing the populace—the future is looking good for South Africa. It was explained to us that the brightly coloured Orlando Towers that are visible from all over Soweto act as a beacon of hope, and the lively murals display the town’s energy.

As a surprise for my birthday which I celebrated whilst in Africa, I was flown to Cape Town for a long weekend. I found the city to be liberating, as unlike Pretoria and Johannesburg, you can walk anywhere in the shadow of Table Mountain as a tourist quite safely. This afforded me a pleasantly different perspective to the city than if I’d have been forced to look through a car window. The docks, in particular the V&A waterfront, are superb to wander around—especially at sunset.
We took the cable car up Table Mountain, a world heritage site and national park, with its own ecosystem with several endemic species. From here we were treated with fantastic views of the Cape of Good Hope, and all of Cape Town spread out below.

We also took a ferry out to Robben Island, home of the prison where Nelson Mandela spent many years imprisoned. The tour here was made especially poignant as it was led by an ex-inmate of the prison who had seen first-hand some of the horrendous things carried out during the struggle to end apartheid. The guide ends with the cells where Mandela spent 18 years of his life, and leaves you feeling sombre, and quite grateful for the things we now take as granted.

After Cape Town, we visited the Union Buildings which are South Africa’s answer to the Houses of Parliament. These were receiving a fair bit of international coverage at the time due to the vote of no confidence in President Zuma. Also in Pretoria, we visited the Voortrekker Monument, which was built in memory of the Boer pioneers who fled the southern British colonies, and settled in the north. Interestingly, I also got to see the small herd of zebra that live around the monument.
From Pretoria, we drove to uKhahlamba-Drakensberg Park, a world heritage site and national park, where we had booked a mountain hut for a few days. This section of the Drakensberg mountains was the prehistoric home of the indigenous San people, who have left rock paintings in the numerous caves hidden up in the hills. Our cabin was remote, tucked 1400 metres up in the valley.

We got to see plenty of wildlife hiking the trails here, including baboons and the elusive Eland, a type of large antelope that was once sacred to the San people as both their food source and gods.

Visiting the cultural museum dedicated to the San people and their rock art, we were able to gain a small understanding of the way of life here during the stone age. What they ate, how they hunted, and how they produced the pigments and paints to produce some of the oldest artworks in the world.

I really cannot stress just how scenic and gorgeous this region really is. Everywhere you look there is a new view to take your breath away. Plus, compared to a lot of European parks this place is empty. Some days on the trails we saw one or two people and that would be it for the day. You really do feel isolated and wrapped up by the mountains, and it’s really quite refreshing.
The geology of this region was simple, but very beautiful. Planar, horizontal sequences of sedimentary units, predominantly sandstones and quartzites, make up the lower hills. These relatively soft and easily eroded stones display a wide range of colour from purple, yellow, red, and white due to varying mineral contents. These produce vibrant cliffs that change as you follow them up the valleys. It’s in these eroding layers of rock that the caves the San people called home are found, and they can give way to strange looking formations as we saw!

Mushroom Rock - its real name-formed as a lower bed of sandstone eroded faster than the more resistant layer above, leaving behind a wider cap of rock.

Synsedimentary structures were observed within the sandstones, for example cross bedding and grading. Later erosional damage was also seen such as onion-skin, and honeycomb weathering.

Evidence of magmatic activity was also seen in the form of basalt dykes seen cross-cutting the horizontal sedimentary strata, providing a relative age of the two lithologies.

Topping these lower hills, is the main Great Escarpment. A rugged basalt ridge that is almost vertical and acts as the natural border between South Africa and their neighbour Lesotho. This tough basalt protects the lower, softer sandstones, slowing erosion and allows the peaks to reach over 3000 metres and providing an awesome skyline.
After the Drakensberg we visited the Cradle of Humankind, a selection of limestone and dolomite caves where the fossilised remains of early protohuman hominids were discovered, including the famous Mrs. Ples, and Little Foot- 2.3 million year old *Australopithicus africanus* skeleton fossils. The earliest recorded use of fire as a cooking tool was also discovered here, dating back 1 million years.

In only 2013, a new cave system was discovered with fifteen 300,000 year old *Homo Naledi* skeletons, and we were fortunate enough to see some of the remains on display. It is believed the caves were used as a burial chamber, as it is unlikely the hominids could have lived permanently in the caves.

A guide took us 60 metres below ground into the Sterkfontein Cave system. Inside were the remains of a limestone mine, which at height of the South African gold rush supplied the lime used to refine and process gold. Unfortunately this meant the calcium carbonate speleothems were gone and the cave looked a little forlorn compared to the original photographs we saw. However we got to see active dig sites led by anthropologists from the University of Witwatersrand, and the original location of the Little Foot fossil.
Approaching the end of my stay, we finished on a high note by visiting Pilanesberg Game Reserve. For a day we drove around the trails looking for the elusive animals and ended up seeing hundreds, including some of the big 5 game of Africa. Despite this, there was also time to learn about the geology of the area. Pilanesberg is actually built around an igneous complex, the same sort of which I am doing for my third year mapping project in Scotland. It’s called a ring complex and forms when an underground magma chamber empties, causing the overlying rock to fall into the void, producing a caldera like structure. Indeed if you google ‘ring complex geology’, the top results are Pilanesberg, and my Scottish version in Ardnamurchan.

Some rare minerals could also be found in the reserve, including uranium-rich tuff.

Throughout our time in the reserve we saw hippopotami, zebra, elephants, and a lone giraffe among many others. I had a great deal of fun trying to photograph the animals despite their best efforts to hide behind some grass or scrubs whenever they could.

In reflection, I had a truly superb time exploring a fascinating nation. South Africa is an advanced state with all the modern amenities and industry, and yet it is so very easy to pull back the veneer and find areas and lifestyles that are still rough and rugged.

I saw mud and straw huts next to modern brick and mortar homes. I saw kids buying their first rifles at eleven years of age. I saw townships rife with crime and a people still divided.

I would go back in a heartbeat.

I like to think I’ve learned some things from my trip, and it is certainly not an experience I shall forgetting anytime soon, and so one last time; thank you Leicester.

**Expenses:**

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*A total of £400 was received from the university. This paid for my international flights in-entirety.