

The Pilanesberg Fluorite Experience

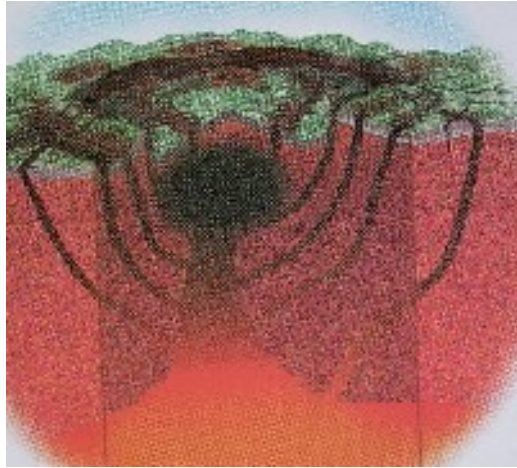
Guido De Beer

The Moepe fluorite mine is located in the Pilanesberg National Park and is an annual outing for the Witwatersrand and Pretoria Gem and Mineral Clubs. All who had registered for the outing met at the Bakubung entrance to the park at 9AM. Allan Fraser, our outing leader for the day, gave an introduction to the geology of the Pilanesberg and the fluorite deposit at the Moepe mine. He explained that the volcanic eruption that created the complex could be compared to size of the Mt.Saint Helens eruption in 1980. A specimen of the herringbone fluorite found at last years outing was passed around for members to see with Allan explaining that if the rock was struck at the correct angle then it would cleave along the octahedral plane of this form of fluorite and the herringbone structure could be seen. Allan also explained that the Pilanesberg is the only national park, which provides geological information by means of plaques and polished rock sections which have been erected at selected localities throughout the park.

Our convoy traveled to the mine along the main Bakubung road to an open area near the mine where we parked our cars. At the open area we were met by a game warden named Paddy who was to be our guide. Paddy explained that he was going to protect us on our walk to and from the mine and that we had to obey his commands in case of an encounter with predators or potentially dangerous game. A black rhino is resident in the area of the mine.

We followed Paddy on the short walk through dense undergrowth to the closed off mine adit and then to a shady patch alongside two fluorite ore dumps. Paddy instructed us to wait here for his return as he needed to make sure that the mine area was clear of predators. Allan used this opportunity to give detail on other areas of the park such as the Lenong View, where one could see most of the ring structure making up the Pilanesberg. In years gone by one could clearly see Rustenburg from this point. Sadly, this is no longer possible because of the increased air pollution in the Rustenburg area. At Lenong View, volcanic ash could be found and Allan mentioned that he had found within this ash purple acicular crystals of unknown identity. The Pilanesberg Alkaline Intrusion is the erosional remains of a series of ring dykes that intruded into the rock of the Bushveld Complex subsequent to the collapse of the crust after volcanic eruptions some 1500 million years ago. The prominent ring mountains are

mainly composed of intrusive alkaline igneous rocks, called foyaite and syenite, which were forced up through the circular fractures, but cooled before reaching the surface.



*The ring-dykes making up the Pilaesberg Alkaline Intrusion
Courtesy: Jacana*



Typical arrangement of the loose fluorite material (free of vegetation) found on the dumps.

Everyone stormed the dumps when the "all clear" signal was given by Paddy. The sound of our hammering broke the silence of the area and several zebra some distance away were seen to move away from the unfamiliar sound. Paddy, rifle at the ready, remained on top of the dump constantly surveying the surrounds.



Club members clambering over the dumps in search of herringbone fluorite



View of the Pilanesberg National Park looking south from the ore dumps



The entrance to the Moepe Mine. The adit is partly sealed off and is unsafe to enter



Typical material found at the Moepe Mine site. The left picture shows the typical herringbone structure of this fluorite and the cleave in the octahedral plane. Associated minerals are aegerine (dark green) and eudialyte (pink) and feldspar (beige)

After 2 hours on the dumps we had collected enough material. With heavily laden bags we left the site and started the descent to our vehicles. This was indeed a great outing and a beautiful experience. The circumstances of collecting in this park dictate that only a small controllable party can take part if the outing is to be successful. It is becoming a popular outing and is booked up for months in advance. The outing was a great success and a big thank you to Allan who had arranged the outing to the last detail.

Editors Notes

The levels of fluorine in the water at the Pilanesberg are relatively high and it is believed that this may be the reason for low fertility in the recently introduced buffalo, last of the 'big five' to be introduced to the park [source; Friends of the Pilanesberg organisation].

The relatively large amounts of fluorite in the rocks makes for interesting thought; would the outgassing of the volcano have been rich in compounds such as hydrofluoric acid? Fluorite has been found in other regions of the Complex in a bore core sampling exercise done some years back.

In previous years a tour to the mine was done every Saturday by the Parks Board but was eventually stopped due to lack of public interest. A few years ago there was a sign at the Bakubung road indicating the Moepe Mine, but today there is no longer a sign which seems tragic as this mine is part

of our national heritage and the public should be made aware of this locality in the same way the other areas of the park are demarcated.

At the mine site an illustration of the fluorite is done in the form of a thin section of the herringbone fluorite which one can view through a small lens provided. Several pieces of mining gear are found at the mine, left to rust when the mine closed. The toilet facilities erected for visitors to the mine have long since been destroyed by elephants as they pulled the roof off and smashed the door and walls.

Further to the northeast of the Pilanesberg Complex are two much smaller alkaline intrusions slightly younger than the Pilanesberg but of the same composition. These formed as the ancient continent moved over the mantle 'hot spot' that had created the Pilanesberg.

The other minerals that are found at the mine and associated with the fluorite are dark green acicular aegerine (acmite) and pink eudialyte. The herringbone habit of fluorite is very rare and has only been found at a few localities in the world.

The Pilanesberg although geologically very old is relatively young compared to many of the other geological formations in southern Africa such as the Bushveld complex and the Witwatersrand basin both of which predate the Pilanesberg. Similar Alkaline Intrusions to the Pilanesberg occur and an example is at Lovozero in Russia.