

Jwaneng — The Untold Story of The Discovery of the World’s Richest Diamond Mine

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Introduction and Ethnographic History

The Jwaneng Diamond Mine is, by value, the richest global diamond mine. Harry Oppenheimer said in 1978 that Jwaneng is ‘the most important primary deposit found anywhere in the world since the discovery at Kimberley more than a century ago.’ The mine opened in 1982 after discovery in December 1972, but the discovery story has long been clouded in *mystery*.

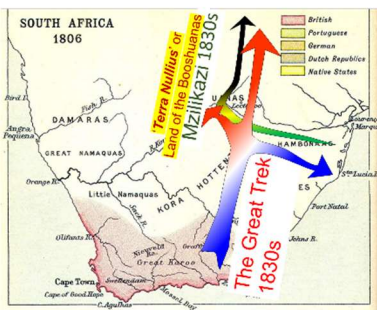


Figure 1: South Africa 1806.

19th century European colonial expansion included the Scramble for Africa. The *Difaqane* was an African migration away from the Zulu Nation. The Great Trek of Boer farmers moved north, escaping the British (figure 1).

Ndebele and Boer Voortrekker skirmishes with the Booshuanas on the eastern fringes of *Terra Nullius*, or ‘Land Belonging to No One’ were repulsed: The Ndebele went north to Bulawayo; the Voortrekkers established the Orange Free State and the South African, or Transvaal, Republic.

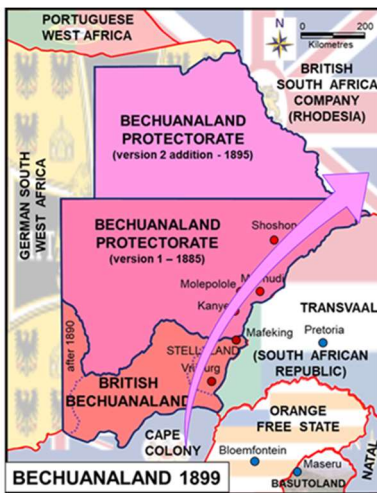


Figure 2: Bechuanaland 1899.

The threat to the *Booshuanas* did not end there. The arrival in South Africa of Cecil Rhodes in 1870 presented a new threat. Diamonds and gold, in what was to become South Africa, were discovered in the 1860s and 1880s (figure 2).

For the Batswana the threat of Rhodes and the BSACo was put to rest in 1895 when three Chiefs (*Dikgosi*) went to London to petition Queen Victoria to remain a Protectorate, despite Rhodes’ opposition. Thus was the integrity of modern Botswana established, and a peaceful interlude ensued.

Kgosi Tshekedi Khama, was appointed Regent for the Bamangwato in 1925. Sir Charles Rey’s arrival in 1930 as Resident Commissioner began with his proclamation that he was: ‘Monarch of All I Survey.’ (Rey, 1988).

Rey was determined to promote minerals development; Tshekedi resisted development because ‘(He) felt that it (mining developments) should only come when the people could welcome these developments on their own terms.’ (Prain, 1981)

The Preliminaries to Discovery

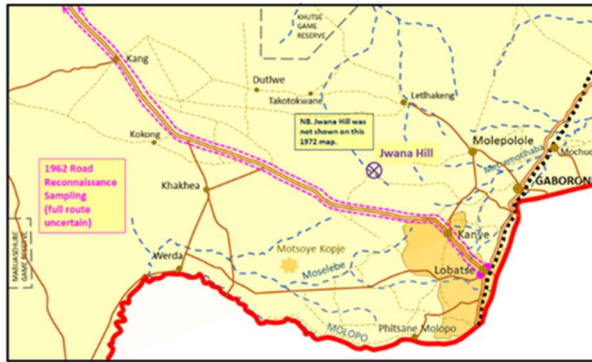


Figure 3: 1962 Road reconnaissance Sampling, Southern Bechuanaland.

Twenty years later Tshekedi met Sir Ronald Prain of Rhodesian Selection Trust (RST), and a new era of cooperative minerals development began.

In 1959, Consolidated African Selection Trust (CAST), an RST subsidiary, found three diamonds in stream sediment samples in the Motloutse River in northeast Bechuanaland.

Road Reconnaissance Sampling from Lobatse to Ghanzi in 1962 passed within 20 km of Jwaneng (figure 3). A gold pan failed to recover heavy minerals.

Finding Jwaneng first may have resulted in an alternate history. Fortuitously that did not come to pass.

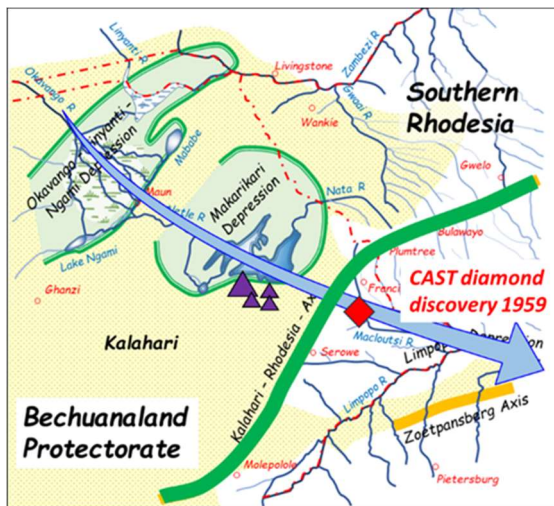


Figure 4: Kalahari – Rhodesia Axis, Du Toit (1933).

Du Toit (1933) described crustal arching that truncated major eastward-flowing river courses (figure 4). This inference led De Beers beyond the uplift and watershed to the Orapa/Lethlakane area. Another Road Reconnaissance Sampling programme in 1966 revealed the discovery waiting-to-be-made.

Dr Chris Jennings, while working for the Bechuanaland Geological Survey, shared the Du Toit concept with Dr Gavin Lamont, the Country Manager for De Beers in Bechuanaland from 1955.

Lamont sampled eastern hardveld drainages using a gold pan. Interfluves were sampled with a ‘stoop and scoop’, or ‘lame duck’ method, so-called because of the up-and-down motion (Lock, 2019). New sampling protocols were applied in the Orapa discovery.

The Road to Jwaneng

Two short years after the Orapa discovery, Lamont moved his teams south. Bioturbation by termites explained Kimberlite Indicator Minerals (KIMs) at surface (Lock, 1985). Lamont observed their fossil tunnels as the Kalahari pre-stripping began, calling the termites Jwaneng’s first miners.

By the end of 1969, Lamont (2011) reported the first recoveries of ‘kimberlitic ilmenites’ as Mike Whateley progressed westward. The first of the Jwaneng kimberlites was discovered in early 1972, but it was barren. Pitting depth was constrained by regulation and drilling depth by equipment capability.

The Eureka Moment!

Repeat Detailed Grid Loam (DGL) sampling in late 1972 was followed by ground magnetic surveying. Hundreds of ilmenites, and minor pyrope garnet counts, were recorded. Rare bright green diopside and diamond were also found.

A brand-new entirely manual Geometrics Proton Precession Magnetometer was deployed in November 1972. Magnetic contours and ilmenite count contours were evaluated by manual moving average estimates. A new drill target was selected based on the ilmenite grain counts and total magnetic intensity (figures 5 and 6). The first new drill target returned 'suspected kimberlite' at 138 feet depth at 11 am on 16 December 1972. 'Suspected' because the drill chips were little more than pink powder. The abundance of ilmenite and garnet was enough for celebration of our Eureka Moment! Jwaneng 2424D/K2 was confirmed with drill core in early 1973. Determination overcame drilling protocol.

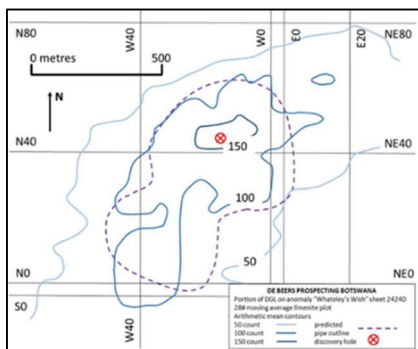


Figure 5: DGL – contoured ilmenite counts.

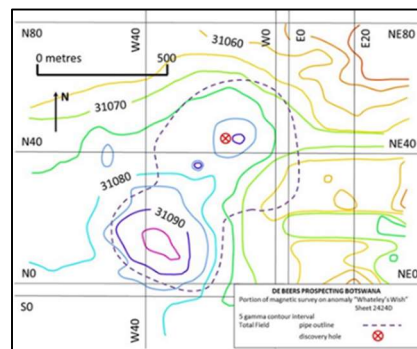


Figure 6: Total Magnetic Intensity – contoured 5 gamma intervals.

Core drilling in early 1973 confirmed the kimberlite identification. Jumper (Cable Tool) drills were employed to penetrate the Kalahari sand cover. Diamond resources were demonstrated despite multiple technical problems (Lock & Barton, 2007).

The Jwaneng mine opened on 14th August 1982 with initial production of about 3 million tonnes per annum. Grade and value are always so difficult to state but the starting grade in excess of one carat per tonne, and value of the order of US\$100 per carat together with modest production costs are what made this mine the richest in the world.

References

- Du Toit AL (1933) South African Geographical Journal, XVI, 3-19.
- Lamont GT (2011) in. Prospecting in Africa. Narratives by early De Beers explorers in the search for diamonds. (Eds) De Wit MCJ, Köstlin EO, Liddle RS (2011) De Beers Consolidated Mines Ltd. p. 191.
- Lock NP (1985) In Prospecting in Areas of Desert Terrain. IMM London. 183-190.
- Lock NP (2019) Diamonds Source to Use. The Journal of the SAIMM. Vol. 119. 155-164.
- Lock NP, Barton E (2007) In Kimberley Diamond Symposium. www.gssa.org.za Unpaginated.
- Prain RL (1981) Worcester Park. p180.
- Rey C (1988) Botswana Society, Gaborone. p282.