

THE ROAD TO ARGYLE: A HISTORY OF DIAMOND EXPLORATION IN WA

At the meeting of 6 August 1997, Ewen Tyler, the Director of Ashton Mining Ltd., presented a comprehensive overview of the history of diamond exploration in WA, a history in which he played a prominent role. Ewen studied at UWA, under Rex Prider, graduating in 1949. He then spent 10 years in Africa before working for another ten in London, where he arranged money for diamond exploration, and also platinum, but that was much harder to accomplish.

Rex Prider had studied lucite lamprolites similar to the kimberlites of South Africa. This had inspired Ewen to continue in a similar vein, hence his time in South Africa, and since 1973, to explore in WA, ending with the success story at Argyle.

Argyle is the largest producer of diamonds in the world, producing 35–40% of the world's natural diamonds, one half being industrial and the other half of gem quality. Gems are the most important and therefore the main business.

After this short introduction, Ewen interspersed his talk with many interesting slides, the first being of the High Priest of Exodus with a large diamond in his dress breastplate. The body-decorating industry has been around a long time. There was a 1486 lithograph of an Indian working to recover alluvial diamonds. Concerning the history of diamond mining, the first report comes from India in 450 BC, but the first kimberlite wasn't found until 1930, again in India. The first mineable kimberlite was found in 1871, five years after the discovery of the first diamond in Africa.

What is a diamond pipe? It is a kimberlite from an old volcano containing special minerals and has steep circular vents produced from great depths and at high speeds; but not all kimberlites contain diamonds.

Ewen started searching in 1969 but didn't find anything until 10 years later in 1979. It doesn't happen quickly or easily. First there was South Africa, then in the 1950s, pipes were discovered in Siberia and now Australia. Canada may be next.

How do we search for diamonds? The volcano erupts, material is washed away and the diamonds are found at great depths. There are indicator minerals of microscopic size, such as phlogopite, garnet, pyroxene, ilmenite (magnesian) and spinel. There needs to be a lot of painstaking laboratory work to find these. In South Africa, they dollied into a pan at a trap site of indicator minerals; these were then inspected by geologists. In Australia, the first diamond was discovered at Bathurst, NSW in 1851, but no kimberlite. Diamonds also turned up at Nullagine in 1895. Ewen doesn't believe we've found all the diamonds in Australia yet.

In the 1970s, they used helicopters to send geologists out exploring. The site selection is important, also the sample collections. Women are good diamond explorers, e.g. Maureen Muggeridge found the first evidence of diamonds on 25 August 1973 (Ewen's birthday) at Pteropus Creek. This is 200 kilometres north of Wyndham and not easily accessible. Here they found three indicators and Di, the first diamond. They got back in via Berkeley River. They rolled drums of fuel off barges and used prawn boats to bring in gear. The immense tidal flows were a nuisance for incoming vessels. One boat sank. The vegetation was very thick and barramundi abounded at the point of salination of the river. Ewen thinks the Kimberley was much more thickly wooded in geological time than now. They moved to Drysdale River, to Tamarindos, east of Kalumburu. They found diamonds and indicator minerals in the King George River.

Five companies were in the original syndicate and CRA was invited to join. After the first quarter carat (1 carat = 1/5 gram) diamond was found, CRA decided to join. Ewen went to London with eight diamonds in his pocket and was nearly robbed.

The first indicator mineral was found on the Charnley River and 1200 samples were taken in the first programme. In June 1974, indicator minerals were found in the East Kimberley at Wilson River but it was not until October 1979 that the ones at Argyle were found. There are diamonds at Ellendale in the West Kimberley too, with different indicator minerals from those present at Argyle. At Ellendale, garnet, chromite and chrome dropside are present. In the exacting work of using a microscope to find diamonds and indicator minerals in the samples, women tend to have better discerning skills than men.

The first kimberlite found was at Skerring in 1976, but alas, no diamonds. The second real discovery came in South Kimberley at Big Spring.

In 1977, the syndicate applied for tenements to cover the West Kimberley deposits. Vast quantities of rock have to be processed to find diamonds and, by the 1990s, insufficient carats of diamonds per tonne of rock were being recovering to operate in the Ellendale field, which was very disappointing. But the process water dam was full of fish and birds, even through man-made.

The kimberlite pipe at Argyle is a 1.2 billion year old volcano and is one of the oldest in the world. Ellendale at 20 million years is the youngest in the world. The first proposal to search for diamonds was made in October 1969 and the Argyle kimberlite body was found in October 1979. Finding the first diamond was incredibly exciting. Argyle has 7 carats/tonne, worth only US\$6.50 per carat when it was opened; a low value, but there are plenty of them. The valuation and assessment of stones is important. Grade is usually stated in carats per 100 tonnes not carats per tonne. There are 7000 categories of rough diamonds, with an enormous spread of

value. They are sorted into size and colour categories. Production is 40 million carats per year, but over 50% of this production is low value. Security has to be very strict and body searches are carried out.

The establishment of the mine began with preparation of the pit at Razor Ridge. The \$425 million mine was built in just under two years and the company re-contours the ground and re-vegetates after mining. An accommodation area had to be built to accompany and service the mine and a water pipeline was taken underground from Lake Argyle. Ten percent of the workers are Aboriginal and 20% are female. The women perform many tasks, including those of fitters, and the female touch is more sensitive for operating heavy equipment. Argyle is now a \$400 million a year enterprise which has established its own cutting and polishing industry. Pink diamonds are collectors items; a 1 carat stone may be worth US\$1 million but there is also an outlandish royalty—22% goes to the WA Government.

Here Ewen finished his most interesting delivery and Kevin Kenneally thanked him for such a well-prepared and executed talk.

Daphne Choules Edinger