In 1967, blue-violet crystals of the mineral species, zoisite, were discovered south of Mount Kilimanjaro in northeast Tanzania. The host rocks of the discovery, which are orders of magnitude older than Africa’s highest mountain, form part of the Lelatema Mountains which are located very near the town of Merelani. In 1968, Henry Platt of Tiffany & Co. christened the new and remarkably beautiful zoisite gem, Tanzanite, to honor its single-source discovery in Tanzania. The 50th anniversary of its discovery is marked in 2017 and is the most notable and exciting event of the gemstone industry of the 20th Century.

The most striking feature of Tanzanite is its color. Or colors. It is a pleochroic gemstone. More specifically, a trichroic gemstone simply means that it naturally displays a different color in each direction, or on each axis. The fine crystals display intense, well-saturated and deep colors. The color-causing element (or chromophore) of Tanzanite is vanadium. Think of it the same as the element chromium giving Rubies their red color. The vanadium is responsible for the blue-violet color in Tanzanite. If any geological history needs to be mentioned, it is this because the rare availability of the vanadium during Tanzanite’s formation is what ultimately is responsible for what makes this gemstone so beautiful, desirable, and popular.

The vanadium is a trace element that came from the organic (tree and plant) material that was deposited with eroded silica-rich sands and calcium-rich (shell and ocean-life) material in a deltaic/shallow sea environment over millions of years during the gradual break up of Gondwana. This accumulation of layers was subsequently buried and metamorphosed at high temperatures and pressures. The organic material became graphite, the silica-rich sands became the schist and gneiss, and the calcium-rich material became dolomite (an impure marble). All these rocks are seen in the deposit. At 500 million years, a geological event resulted in the crystallization of Tanzanite. Erosion on the surface on the earth and the natural upliftment of continental crust (in respect to the denser and heavier oceanic crust) brought this deposit to the earth’s surface where Tanzanite was found for the first time in 1967.

The transition from a collector’s stone to being commercially available started in earnest in
the late 1990s when the Tanzanian government started adequately regulating the deposit by subdividing the 7-kilometer section into Blocks A, B, C, D, and D-Extension, respectively, and granting mining licenses to companies and individuals at different levels of investment ability. Block C, the largest 2 km² of the 7 km², was awarded to African Gem Resources Limited (Afgem), a private South African company, after winning the tender in 1998. Only in the early 2000s did the company start investing heavily in geology and mining as production was decreasing and becoming more haphazard after an initial and significant bulk sample that raised millions of dollars for Afgem.

The investment in geology and mining resulted in a better understanding of the deposit’s geology and the Tanzanite-bearing structures, and in turn increased the company’s production. The increased production resulted in increased revenues that were put back into the mining. More shafts were sunk, more mining faces were created, and from a geological point of view, more geology was exposed on the sidewalls. With all this work, a geological model was created, as well as an understanding that was never in place before. Another result was production areas could now be proactively planned as opposed to a history of reactive mining. Essentially, we were able to get the mining into the right places. As a result, from 2005–6, production from the company improved to more consistent commercial volumes. It must be noted that at no point can a geologist predict the gemstone; we are always predicting the geology in which the gems are formed. From

A: Tanzanite crystal in a pocket in Bravo Shaft.
B: Pocket containing Tanzanite in Bravo Shaft.
C: Self-portrait taken August 2005 from the largest pocket of Tanzanite I have seen in the deposit.
mid-2000, the consistent production from the mine was a result of having the mining faces in the right areas. If one face was not producing, another one was.

In late 2004, Afgem become a publically traded company, TanzaniteOne Mining Limited (TanzaniteOne), and listed on the London Alternative Market (AIM).

Large-scale mining operations generate not only more production volume, but also more volumes of all grades, more consistently. As a result, a master grading set was created. For the first time, rough Tanzanite could be parceled for size, colour and quality to its sightholders. By definition, this system of product presentation for rough sales could only work with regular and good volumes of production from the mine. This was a direct result of the size of the deposit being professionally mined, with regular production and future exploration.

Afgem initially, but then TanzaniteOne, took a collector’s gemstone to one that became commercially available around the world. But the story does not end there. Because it is commercially available does not mean that Tanzanite is any less rare than it originally was. It just became accessible to everyone; but only for a limited time: our lifetime. Found for the first time in 1967, it can be estimated that the gemstone will no longer be accessible, particularly commercially, within a single generation of its discovery.

The most common understanding of this is that the deposit gets physically exhausted (mined out), but the actual concept is that the costs to mine become too high versus the income from sales (i.e., the gemstones are still in the ground but are physically too deep to mine—too expensive). This factor highlights its generational rarity, which the current market and value of Tanzanite do not indicate. The market and consumers think that because there are high volumes of Tanzanite available at the moment this will continue; but this not the case.

The current prices of Tanzanite, particularly at the wholesale level, are actually too low; too low for how rare the gemstone is, and too low for future mining. The amount of Tanzanite on the market currently should be seen as a bubble and temporary; it will not continue. There has been a lot of recent supply due to many miners being in the right areas and producing, with this product subsequently making it to the wholesale market. This is the reason for the low wholesale prices, but with the mines getting deeper, and the natural pocket effect of Tanzanite, this will not continue. The reality is that the deeper the mines get, the more expensive it will be to mine. For future years of supply, the wholesale prices need to increase.
Above Right: Light.

Tanzanite worn by its owners. A story that is hidden within each piece of Tanzanite, a story of rarity that needs to be shared; a story that should be given more importance. No one asks for it, so it should only be seen as a guide and less option but is strictly tied to a person’s honesty, rarity. Trying to tie the availability to a number of years should be seen as a phase coupled with years anyway. Old stock or old mined material, a few simple gemological tests. Another wonderful and valuable characteristic of Tanzanite is that there is only natural mined out, and very little or no material is available anymore; nothing significant in recent years anyway. Old stock or old mined material that do become available command extremely high prices today. We can only look back and realize the value of something that is rare. Trying to tie the availability to a number of years. According to me, less importance and significance should be given to it. The history of the talk of only available for another 10 years, or decades. This second condition may be a potential trichroic. It is also part of the orthorhombic crystal system. As Tanzanite extracted from the earth is often in its perfect rectangular crystal shape, it is easy to see its trichroism (meaning you can see a color on each axis, or side of the gemstone). These natural rough crystals can show either a 3-colour trichroism combination of blue, violet, and brown (combination of red/yellow/green) or a 3-colour trichroism combination of blue, violet, and violet (so two violet axes, or sides), respectively. The reason for the two combinations of trichroism is due to natural (in the ground) heating that a percentage of the natural crystals were locally sub-jected to. The natural heating has removed the original red/yellow/green on the “brown” axis to colorless, and so the (second) violet color is seen. Technically, this has been achieved by an intervalence charge transfer during heating of Ti$^{3+}$ to Ti$^{4+}$, which is colorless. [As all chemical equations require balance, the second change is a slightly stronger blue-violet (so the V$^{4+}$ to V$^{3+}$). The colour change due to heating is a stable change. As this heating takes place naturally, it is impossible to distinguish between post-extraction (or by man). The result of this means that there are only two realities to label a tanzanite gemstone: no heat or no heat treatment by man. The first is that the gemstone in question displays its blue, violet, and brown trichroism, and the second condition is that a strict and traceable provenance of no heating by man exists of a blue, violet, and violet trichroism gemstone directly from the earth, through the trade to the wholesaler/retailer. This second condition may be a potential