Figure 20: This 34.20 ct quartz from a new find in Brazil contains two euhedral inclusions of sphalerite. Courtesy of Luciana Barbosa; photo by Jeff Scovil.

weighed over 100 ct, but most of the stones were <20 ct.

Although sphalerite inclusions have been reported previously in quartz (i.e. from tungsten deposits and various ore veins; Hyršl, 2006), this find is notable for the clarity of the host quartz and the perfection of the sphalerite crystals, some of which even display complex growth patterns on their faces (Figure 21).

Brendan M. Laurs FGA

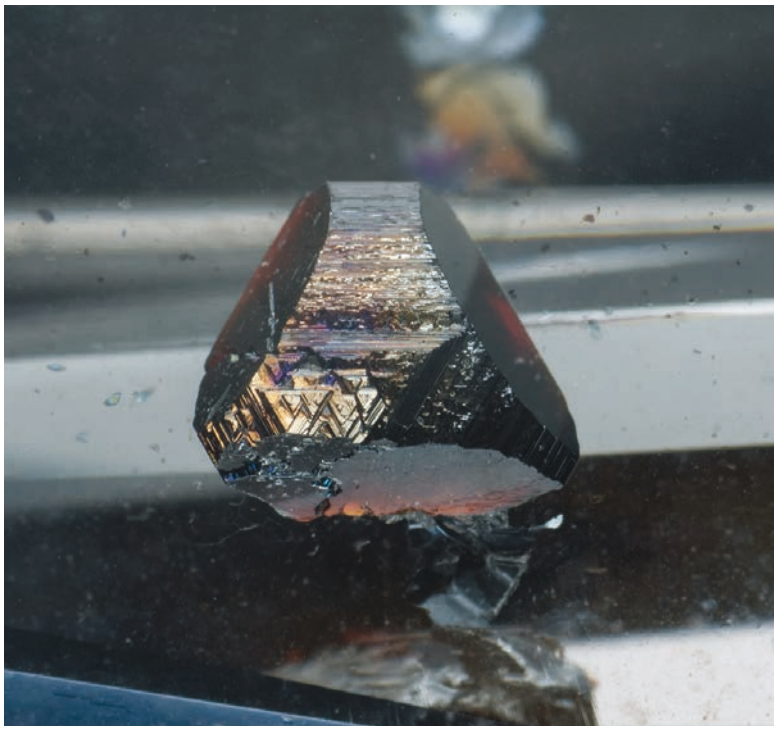

Figure 21: A closer view of the larger sphalerite inclusion (4 mm across) in Figure 20 shows interesting growth patterns on some of its faces. Photo by Jeff Scovil.

Reference

Hyršl J., 2006. Genetic classification of mineral inclusions in quartz. *Gems & Gemology*, **42**(3), 97–98.

Ruby from Liberia

Ruby from Liberia was reported relatively recently by Kiefert and Douman (2011) as small transparent pinkish red to red pebbles from the Mano River, and larger near-opaque purplish red crystals from Nimba Province near the Guinean border. During the 2015 and 2016 AGTA Tucson gem shows, Eric Braunwart (Columbia Gem House, Vancouver, Washington, USA) displayed ruby from Liberia that was different from either material mentioned above. While not of facet grade, it exhibited an attractive sparkliness in reflected light.

Braunwart loaned the sample in Figure 22 for examination. It consisted of a polished hexagonal plate weighing 3.32 ct and measuring 10.16 × 1.96 mm. It was a dull but saturated dark red (World of Color 2.5R3/6, Dark Red) with slight to moderate

Figure 22: This polished hexagonal plate (3.32 ct) of ruby from Liberia displays abundant sparkles in reflected light that are due to reflections from rutile inclusions and polycrystalline grain boundaries. Photo by B. Williams.

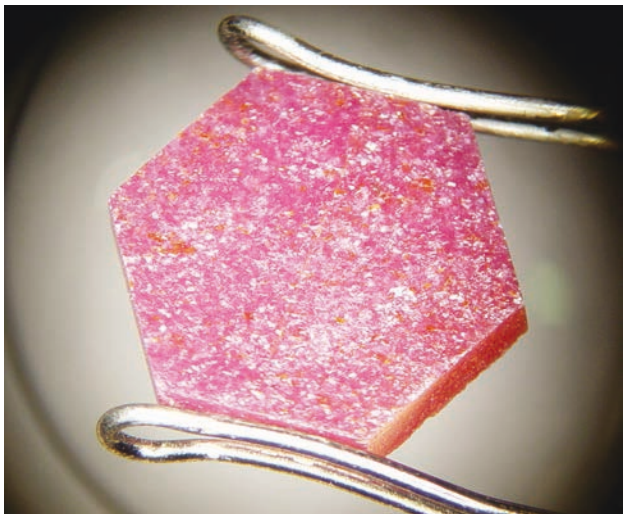

Figure 23: Seen here in oblique lighting, the 3.32 ct ruby shows a granular texture with orangey red domains corresponding to rutile inclusions. Photo by B. Williams.

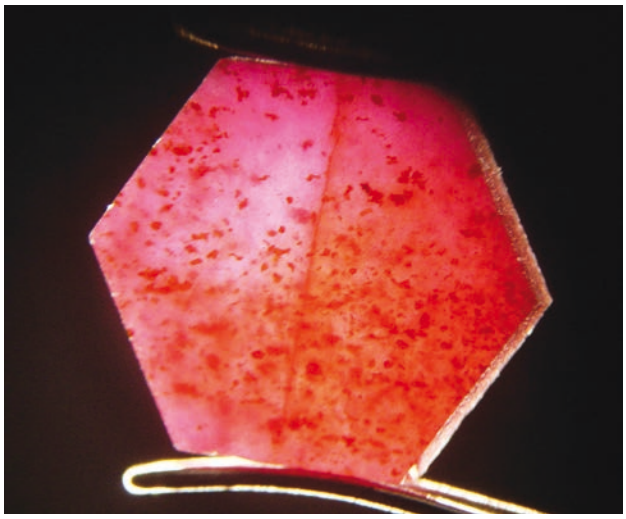

Figure 24: Viewing the 3.32 ct ruby with transmitted light highlights the presence of a partially healed fissure and abundant orangey red inclusions (rutile crystals). Photo by B. Williams.

translucency. Although the hexagonal slice had a shape reminiscent of a cross-section from a corundum crystal, the stone gave a polycrystalline reaction between crossed polarizers, remaining bright throughout a full rotation. Microscopic observation revealed a granular appearance with most individual grains appearing pinkish red, while a few were orangey red (Figure 23). While this might be suggestive of ruby dichroism, the orangey red domains proved to consist of inclusions. Transmitted light revealed numerous translucent, deep orangey red, blocky, crystalline inclusions that were randomly oriented, as well as one partially healed fissure running through the centre of the stone (Figure 24). No other inclusions were observed. RI measurements of the sample yielded a single, weak shadow edge near 1.763. Specific gravity was measured as 3.81; this relatively low value is possibly due to the corundum's polycrystalline structure. The stone was inert to both long- and short-wave UV excitation. Raman analysis with a GemmoRaman-SG instrument confirmed it to be corundum.

It is the sparkly appearance that makes this ruby intriguing. Under magnification, numerous micro-reflections were seen emanating from the polycrystalline grain boundaries, as well as from the inclusions mentioned above. Several of the surface-reaching inclusions were identified as rutile by an Enwave 785 micro-Raman spectrometer. The presence of abundant rutile inclusions is consistent with the elevated Ti content obtained for the sample with an Amptek X123-SDD EDXRF spectrometer. The chemical analysis also revealed the Cr and Fe that are presumed responsible for the red colour of the ruby and lack of fluorescence, respectively.

While ruby with rutile needles is commonly encountered, this material in unusual for having rutile present as reflective grains mixed with polycrystalline ruby.

Cara Williams FGA and Bear Williams FGA

Reference

Kiefert L. and Douman M., 2011. Gem News International: Ruby from Liberia. *Gems & Gemology*, **47**(2), 128.

Yellow Sapphire with Unstable Colour—in Reverse

Irradiated yellow sapphires are rarely encountered in today's market. Although it is possible to irradiate a colourless sapphire to turn it yellow, this treatment is highly unstable and readily fades to colourless upon exposure to light (Nassau and Valente, 1987). We were therefore surprised to learn about a yellow sapphire with unstable colour—in reverse. Harold Dupuy FGA of Stuller