Figure 2: These cabochons of trapiche-like quartz from Brazil show various patterns created by the amethyst-citrine colour zones and/or areas containing abundant black inclusions. The stones range from 15.5 × 11.7 mm to 21.3 × 15.9 mm. Gift of Marco Campos Venuti; photo by Jeff Scovil.

gem materials. However, rather than having transparent sectors separated by inclusion-rich arms, the black areas of this quartz consisted of included sectors that were separated by spokes of transparent quartz.

Sun et al. (2018) recently examined similar stones from Brazil (which they described as amethyst, rather than ametrine), and using Raman spectroscopy they identified the black inclusions as an iron sulfide mineral, likely pyrite. They also documented tiny brownish bullet-shaped inclusions in the arms of the trapiche-like structure that could not be identified but were probably goethite. The latter inclusions were only barely present in just one of the samples examined.

Brendan M. Laurs FGA

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Hessonite from Mogok, Myanmar

At the February 2018 gem shows in Tucson, Arizona, USA, gem cutter Meg Berry (Megagem, Fallbrook, California, USA) obtained some faceted garnets that were reportedly from a new occurrence in Mogok, Myanmar. The parcel consisted of 12 'native-cut' rectangular cushion-shaped gems. According to her supplier (Sai Tit of Cleopatra Gems, Chiang Rai, Thailand), who specialises in Burmese minerals, the stones came from the Lae Oo mine. This may be the same as the 'Le-U' mining area that was described by Themelis (2008) as lying below the well-known Dattaw deposit. According to Themelis (2008), Le-U has produced ruby, bicoloured tourmaline, moonstone, quartz, topaz, danburite and spinel (no garnet was listed), and the mines there were closed in 2001.

Eight of the stones were loaned to authors CW and BW for characterisation, weighing 0.68–1.14 ct (total weight 7.05 carats). Their colour ranged from light-to-medium 'golden' brown (Figure 3). Their RIs spanned from 1.740 to 1.748, with no consistent variation according to their tone. Due to the rather small size of the stones, no hydrostatic SG measurements were taken.

Figure 3: These garnets (0.68–0.99 ct) from Mogok, Myanmar, were identified as hessonite. Photo by Dean Brennan, Stone Group Laboratories.

The GemmoRaman-532SG identified all of them as grossular, and their colouration was fairly consistent with the hessonite variety. Energy-dispersive X-ray fluorescence (EDXRF) chemical analysis with an Amptek X123-SDD spectrometer revealed the expected high levels of Ca and Fe, with minor Mn, Ti and Cr. All samples were inert to long- and short-wave UV radiation, and exhibited some magnetic susceptibility (being just barely dragged by a magnet).

Viewed in the microscope between crossed polarisers, all of the stones exhibited various patterns of bright interference colours (Figure 4). This optical effect may

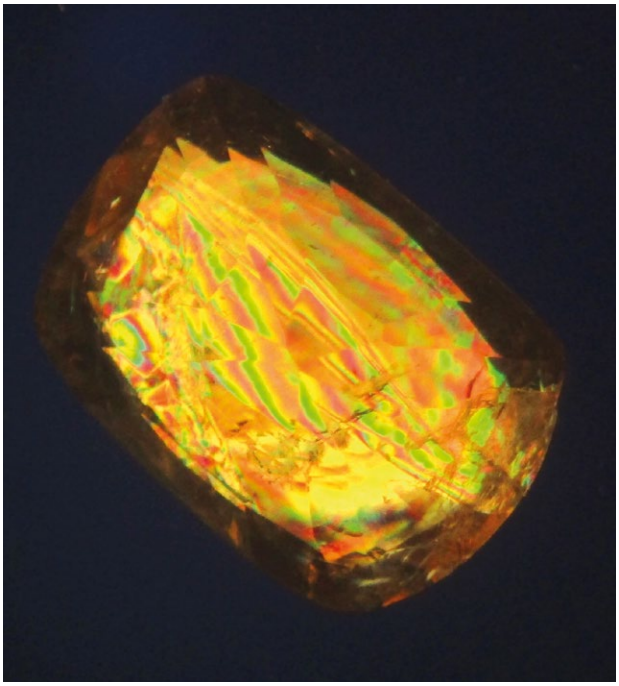

Figure 4: Viewed between crossed polarisers, this 1.14 ct hessonite displays bright interference colours. Photomicrograph by B. Williams.

Figure 5: Internal features in the hessonite consisted of (**a**) various fluid-filled inclusions hosted by partially healed fissures, (**b**) fluid-filled growth tubes and (**c**) an overall haziness in one stone. Photomicrographs by C. Williams; magnified 25× (a) and 40× (b and c).

have been caused by variously oriented twin planes (and associated internal strain) that were prevalent throughout the samples. The stones were moderately included to the unaided eye. The most common internal features were intricate, fluid-filled, partially healed fissures (Figure 5a). Several samples also exhibited a slightly roiled optical effect that was weaker than that typically seen in hessonite. In addition, fluid-filled growth tubes were common (Figure 5b). Similarly oriented, but non-parallel, growth lines were also seen. A hazy area was observed in one sample (Figure 5c).

According to Themelis (2008), facetable hessonite is often found in the Mogok area, particularly around Sakangyi, as crystals that commonly weigh 1–2 ct. The apatite inclusions that he mentioned occurring in the hessonite were not seen in the samples examined here.

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Reference

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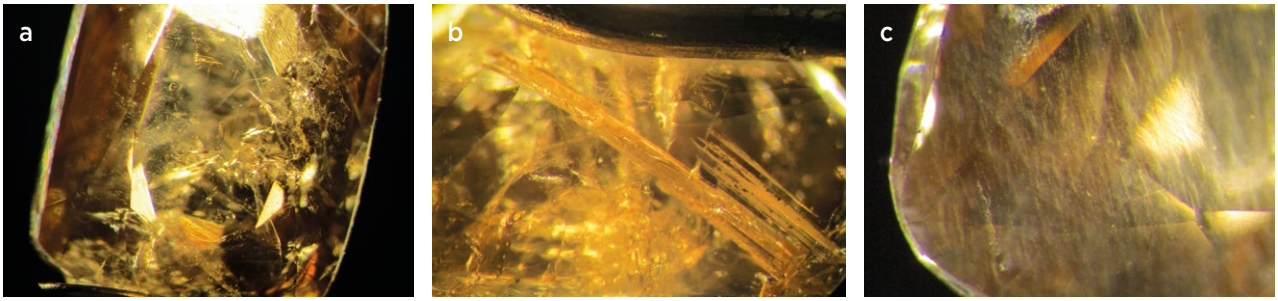

Yellowish Green to Yellow Opal from Brazil

Several occurrences and varieties of opal are known from Brazil (for a brief review, see Caucia et al., 2009). During the August 2017 FIPP gem show in Teófilo Otoni, Brazil, a purportedly new discovery of yellowish green to yellow 'common' opal (e.g. Figure 6) was brought to market by some artisanal miners. They had ~5 kg of rough material, which was purchased by gem and mineral dealer Dr Marco Campos Venuti. He polished dozens of cabochons and tablets in a variety

Figure 6: These cabochons (1.89–6.35 ct) show the range of colour in a new find of common opal from Brazil. Gift of Marco Campos Venuti; photo by Diego Sanchez, © GIA.