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Gem-A The Gemmological Association of Great Britain

The compositional range of tremolite extends from $\square Ca_2Mg_5Si_8O_{22}(OH)_2$ (where $\square$ = a vacancy) to $\square Ca_2Mg_{4.5}Fe^{2+}_{0.5}Si_8O_{22}(OH)_2$, whereas actinolite extends from $\square Ca_2Mg_{\leq 4.5}Fe^{2+}_{\geq 0.5}Si_8O_{22}(OH)_2$ to $\square Ca_2Mg_{2.5}Fe^{2+}_{2.5}Si_8O_{22}(OH)_2$ (Leake et al., 1997; Hawthorne et al., 2012). Electron microprobe analysis of the crystal by one of the authors (FCH) confirmed that it was indeed tremolite: $(Na_{0.05}K_{0.03})(Ca_{1.94}Na_{0.06})_2(Mg_{4.85}Fe_{0.10}Mn_{0.01}Al_{0.03})_{4.99}Si_{7.99}O_{22}(OH)_{1.92}F_{0.08}$. This formula, with $Mg/(Mg+Fe^{2+}) = 0.98$ (cf. Leake et al., 1997) and with $^{A}(Na+K+2Ca) = 0.08$ and $^{C}(Al+Fe^{3+}+2Ti) = 0.03$ (cf. Hawthorne et al., 2012), shows that the crystal has a composition that is very close to the pure end-member composition of tremolite.

In July 2015, Radl reported that he obtained three more crystals of this tremolite from the same find. Also, his supplier indicated that a few kilograms of the rough tremolite were sold into the market as tourmaline. This is not surprising, given the similar appearance of this tremolite to some of the tourmaline that was recently mined from the Mwajanga area (e.g. www.minrec.org/pdfs/Toms%20Online%20report%2039.pdf).

Radl indicated that he encountered significant amounts of tremolite of the same pale green colour (associated with quartz and purple scapolite) during his first trip to Tanzania in 1995. The only other occurrences of gem-quality tremolite known to these authors are yellowish green material from Merelani, Tanzania (Fritz et al., 2007) and greyish green crystals from Bancroft, Ontario, Canada (www.youtube.com/watch?v=od4OfHsGQbg).

Dr J. C. (Hanco) Zwaan (hanco.zwaan@naturalis.nl)
Netherlands Gemmological Laboratory
National Museum of Natural History 'Naturalis'
Leiden, The Netherlands

Dr Frank C. Hawthorne
University of Manitoba, Winnipeg, Canada

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DIAMONDS

Diamond Horse-head Carving

Sculpting and carving are very intricate and patience-consuming art forms. Numerous examples of sculptures and carvings created from stone and various gem materials are known worldwide, but hand sculpting of diamond is virtually unheard of (e.g. Fryer, 1983; Du Toit, 2009).

In January 2015, this author examined a unique two-headed horse sculpted from natural diamond (Figure 19). It was accompanied by GIA report no. 1209011703, certifying it as a carving weighing 4.07 ct that was made from near-colourless natural diamond. It measured 13.72 × 7.02 × 4.34 mm, and the two horse heads formed a perfect mirror image of one another. The carving was well proportioned with precise symmetry when viewed from any direction. Although designed to stand upright on its base, it was balanced with such precision that it would stand upside-down on the ears without toppling over (see Figure 19, centre). When the sculpture was observed in detail, the illusion of harness straps going across the faces of the horses could be seen.

The sculptor reportedly required more than a full year to plan and execute the carving. A paper

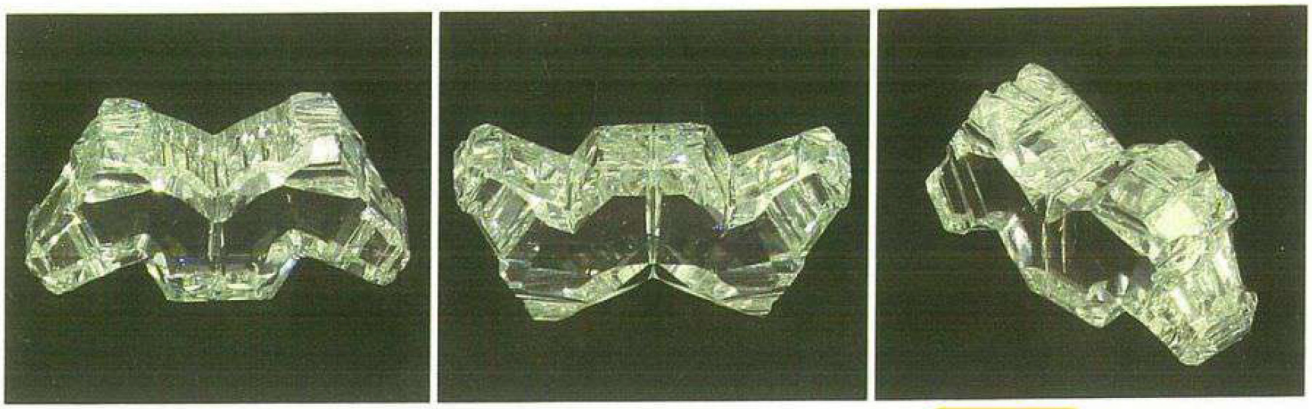

Figure 19: A 4.07 ct diamond horse-head carving is shown in these three views. Photos by Sameer Doshi.

sketch was made first, followed by a wooden prototype, and then the design was marked on the actual diamond rough, which weighed 8.38 ct (Figure 20). Since only a diamond can scratch diamond, to actually carve and sculpt an entire three-dimensional figurine without making use of laser technology required a great amount skill and patience that only a master craftsman would have. The piece was sculpted using subtractive carving techniques, in which material was gradually removed from the diamond rough. Any slight negligence while working could either cleave the diamond or create a misproportioned carving.

One has to give credit to the initiative of the sculptor, as there is no school or institute that provides training in diamond carving. This carving is indeed an extremely rare creation and an amazing piece of art to be treasured.

Dr Jayshree Panjikar FGA
(jayshreepanjikar@gmail.com)
Pangem Testing Laboratory, Pune, India

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Figure 20: The diamond carving started with a paper sketch (left) that was followed by a wooden prototype (centre) before the design was marked on the actual piece of diamond rough, which weighed 8.38 ct (right). Photos by Sameer Doshi.

SYNTHETICS AND SIMULANTS

Gastropod Shell Beads Disguised in a Coral Necklace

The GGTL Laboratories – Gemtechlab in Geneva recently received a coral necklace (e.g. Figure 21) for identification that weighed 100.55 g and consisted of eight round white freshwater cultured pearls and 107 'salmon'-coloured beads (3.3–10.2 mm in diameter). Microscopic examination showed that most of the coloured beads consisted of coral (i.e. *Corallium elatius*: Ridley, 1882). However, the beads present on either side of each freshwater cultured pearl had a distinctly different origin: they were cut from the shell of a gastropod (i.e. *Strombus gigas*: