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Letters to the Editor

Magic of Diamonds

In his article on Diamonds (August *MRS Bulletin*, p. 85), Kevin J. Anderson unfortunately relied on some 1960s information sources, resulting in several inaccuracies.

The reason for the magical properties attributed in early days to gemstones (not limited to diamonds) was not only their beauty and hardness but also their resistance to chemical change and analysis. Hence they were assumed to have been unique materials provided by the deity for the benefit of man, and magical properties were accordingly attributed. When 18th century analyses finally showed that gems were just ordinary chemical substances but in single-crystal form, synthesis was not far behind.

Early writers, such as Pliny, used "adamas" to refer to all types of colorless stones, including "rock crystal" quartz. Much confusion—and amusement—resulted from statements (such as Pliny's) that the way to "soften" a "diamond" is to first soak it in warm goat's blood. Close examination of Pliny's and older texts shows that this process not only works, but is still used today! See "Two Types of Historical Traps," by K. Nassau, *Journal of Gemmology* (London), 22 (7) (1991) p. 339-403.

It is true that x-ray diffraction showed Hannay's British Museum specimens to be diamonds, but a later closer examination (when the characteristics of synthetic diamonds were known) and reconsideration by K. Lonsdale demonstrated that they were not synthetic, but indeed fragments of natural diamond! See *Gems Made by Man*, by K. Nassau (Gemological Institute of America, Santa Monica, CA, 1987) p. 164-169.

Diamonds become radioactive only if colored by burial in radon salts, as Sir W. Crookes did in about 1904. Mechanical recoil from the disintegrating radon implants daughter-product atoms into the diamond surface. Other forms of irradiation used to color diamonds do not produce radioactivity. Coloration is uniform if penetrating irradiations such as neutrons or high-energy electrons are used. See *Gemstone Enhancement*, 2nd Ed., by K. Nassau (Butterworth-Heinemann, Boston, 1994) p. 141-151 and 59-61.

Finally, it might be noted that the "great success" in using chemical vapor deposition to produce diamond and diamondlike films has indeed produced thick polycrystalline diamond films. Thick single-crystal diamond films that would impact the gemstone trade have been "on the verge" for quite a few years, but are still awaited eagerly (or with apprehension).

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