



Garnets

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The sun shining through a jar of golden honey on the windowsill, the burgundy glow of a glass of wine in the candlelight, a meadow warming yellow-green in the summer sun, the bright orange of a child's lollipop. These are a few of the beautifully vibrant colors found in the garnet family, growing in shades of every color except blue. Some garnets show metamerism, producing one color in natural light and another in incandescent light. Unfortunately most people are only familiar with a brownish-red color with respect to garnets (so-called "Indian" garnets); so, for the most part, they remain under-appreciated due to a lack of familiarity and because of their reputation as inexpensive or abundant.

Garnets have been set in jewelry since Egyptian and Roman times and were widely used in the jewelry of the nineteenth century (P46, Oldershaw, Harding, Woodward, 2001). In early days red garnets, and often red gemstones, were known as "carbuncles", which is a term still sometimes used when referring to a garnet cut en cabochon. This term is derived from the German "karfunkel" due to a garnet's resemblance to the glowing red of fire embers (Web: ICA, Idar-Oberstein). This beautiful

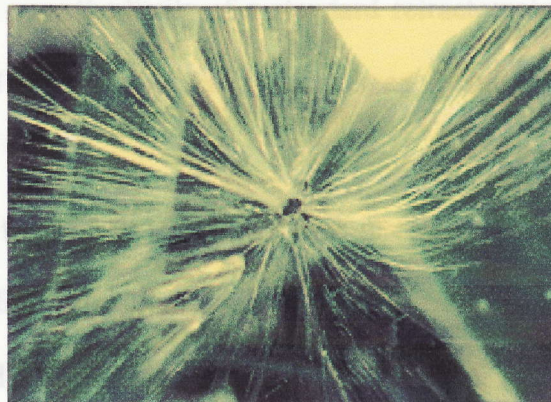
stone was thought to contain many protective powers, to bring eternal love, good health and safe travel, and to ward off nightmares. Its' darkening was thought to be a warning against approaching danger. Garnets symbolize faith, truth, constancy, and fidelity (Web: eclectica.com). Probably establishing garnet's reputation as a secondary gemstone was its' extensive use in low-cost Victorian jewelry when "Bohemian" garnets from Czechoslovakia were the fashion (P56, Arem). The name *Garnet* is thought to be derived from the Greek word "granatum", meaning pomegranate seed, which also has an intense, rich, dark red (www.eclecticala.com).

Garnets are in the range of 6.5 to 7.5 on Moh's scale of hardness, they have exceptional luster and no distinct cleavage making them ideal as gemstones. Garnets are isometric, belonging to the cubic crystal system and displaying a dodecahedral habit of crystallization. The dodecahedron is characteristic to garnet formation as no other shape is to a gemstone. They are isomorphic, having an identical external form but differing chemically from one another (P39, Read, 1999). The same basic formula for all garnets is given as $A_3B_2(SiO_4)_3$ (www.mineralgalleries.com). The problem in naming and classifying garnets lies in the fact that there is a continuous gradation chemically from one to the other (P46, Oldershaw, Woodward, Harding, 2001), specifically with the almandine-pyrope series (pyrospite series – all aluminum silicates) and the uvarovite-grossular-andradite series (ugrandite series – all calcium silicates) (P117, Hankin, 1991). Almost all garnets are of mixed types, approximating to a particular type. These beautiful gemstones are formed primarily through metamorphic processes where increased temperatures and pressures change the nature of the rock, even when the rock may be in a solid, non-molten state. The end result may produce eclogites containing new garnet

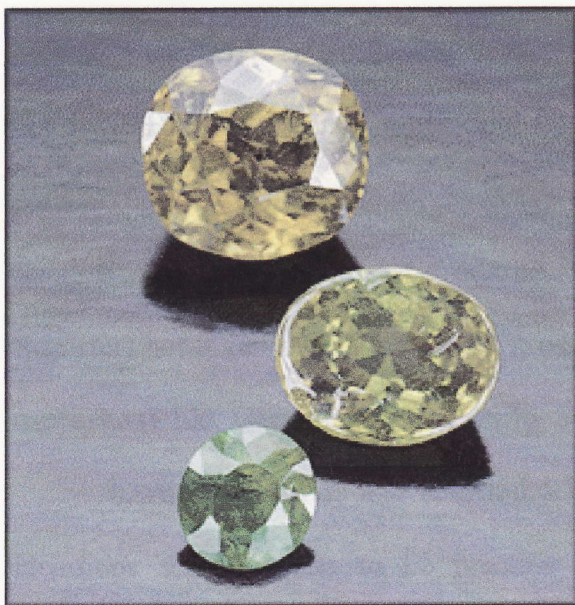
growth within platy mica arrangements, or garnetiferous schists (P95, Rhodes, 1991).

Garnets are found on almost every continent and contain some very interesting inclusions. These distinct inclusions help in identification because they are characteristic to the varieties in which they occur. Hessonite, for examples, has a roiled, treacle effect produced by crystals. Almandite often contains needle – like inclusions, or “silk”.

Tsavorite commonly shows small, white crystals in healed fractures. The demantoid garnet contains a beautiful “horsetail” (byssolite / fibrous amphibole) inclusion consisting of needle-like fibers of asbestos radiating out from a single chrysotile crystal,



and even tiny stones from Russia will usually contain some part of a “horsetail”. Diopside is another distinguishing inclusion in Russian demantoid. (P192 – 194, Gems and Gemology, winter 1999)



Demantoid is one of the few gemstones containing inclusions so characteristic that they permit positive identification (1987, Liddicoat, 1993). It is considered the most precious of the garnets, and is a real collector’s stone. The name Demantoid is derived from the German word “*demant*” meaning diamond, since it, too, has a high

luster but an even higher dispersion (0.057). Demantoid is a variety of andradite (which contains titanium and manganese). It is colored its distinctive green by chromium, and approaches emerald green in its' prize specimens, ideally, intense without being overly dark. A hardness of 6.5 makes it relatively soft and, together with its being brittle, demantoid is best set into earrings, pendants, and brooches where it is less vulnerable to damage. Its' refractive index of 1.89 puts it over the limits of a standard refractometer and its' spectrum shows a band at around 443 nanometers, which is an identifying feature.

Discovered in the Urals in Russia in the 1860's demantoid was instantly sought after because of its beautiful color, high dispersion, and rarity – never having been available in large size or quantity. Demantoid deposits exist in California, Arizona, Italy, Iran, Namibia, Korea, and the Congo. “The first significant demantoid locality outside of Russia was discovered in Namibia in the mid 1990's” although this new material is “not as intense and the stones lack the distinctive horsetail inclusions” (P301, *Gems and Gemology*, Winter, 2000). Russian deposits remain the benchmark by which the gem is judged. Iran has been producing demantoid cat's eye stones from yellowish-green in color to a darker, emerald green, and up to 7.0 carats. The chatoyancy is caused by parallel fibers of chrysotile or byssolite (P68, *Gems and Gemology*, Spring 2004). Synthetic demantoid is not yet produced (P164, *Gems and Precious Stones*, Simon and Schuster) but it can be confused with grossular, peridot, emerald, spinel, tourmaline, and uvaravite (P106, *Gemstones of the world*, Schuman, 1997).

Garnets are varied and beautiful. The array of colors available and their fabulous inclusions show garnets to be precious gemstones, and by no means common or

undesirable: not “just garnets”. Found on nearly every continent, and reasonably priced, it is surprising that more people don’t wear and enjoy garnets. Since the majority of garnets are red this is the color which people associate with garnets, however, there is a near-rainbow of colors to be appreciated. They have beauty, durability, and as shown with the demantoid variety they also have rarity. This together with affordability makes them a perfect gemstone.

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