



WHITE GROSSULAR

FROM NEAR THE STIFLE CLAIM GEORGETOWN, EL DORADO COUNTY, CALIFORNIA

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Colorless or white grossular of near-end-member composition is among the rarer colors for any garnet species. Newly found specimens from California show lustrous crystals and attractive fluorescence.

INTRODUCTION

An occurrence of rare, colorless grossular was discovered by Eric Spencer in June of 2018, near the historic W. L. Stifle claim outside of Georgetown in El Dorado County, California. Eric stumbled upon the find while searching for vesuvianite with his dog, Rocksee. He had been taking a break from digging in order to clear away some brush so she could rest on cool ground—and up popped garnet crystals out of the dirt; she had been lying right on top of the occurrence. I have since had the opportunity to collect and study more specimens from this find.

The Stifle Memorial claim is located on Traverse Creek, 1.3 miles from Georgetown Road (Highway 193), and is now part of the Traverse Creek Special Interest Area. At one time, it was owned by the El Dorado County Mineral and Gem Society but was turned over to the U.S. Forest Service in 1995. It is open to all for mineral collecting.

PREVIOUS WORK

Pabst (1936) described occurrences in the same general area, in a serpentine belt about 2.5 miles south-southeast of Georgetown in the Placerville quadrangle, California. Veins cutting the serpentine contain vesuvianite, grossular (colorless to orange-brown), diopside, clinocllore, prehnite, tremolite and opal—though no single vein contains all of these, and some veins are essentially monomineralic. The white grossular found recently occurs in a small, lenticular, monomineralic rodingite vein surrounded by serpentinite.

White grossular from the Stifle claims was described by Pabst (1936) as follows:

The colorless grossularite forms many small veins alone or with some chlorite and diopside. It is granular to massive and contains only small vugs lined with clear perfect crystals . . . Five colorless grossularite crystals from the main “gem” pit showed the forms (110), (211), (321) and (332). Three also showed very small cube faces. The habit of these and the other white garnets may be trapezohedral or dodecahedral, and both types may occur in the same vein. These garnets do not, in general, exceed 2 or 3 millimeters in maximum dimension. Only in one vein, consisting of garnet with minute rosettes of chlorite, were there found trapezohedrons of grossularite reaching 5 millimeters or more in diameter.

Pabst (1936) also provides a chemical analysis of the white grossular and a determination of refractive indices.

THE NEW FIND

The white grossular lens found by Eric Spencer is about 3 meters long, up to 1 meter thick, and dips at a 45° angle. The white to colorless and transparent grossular crystals are generally small (1 to 7 mm) and occur as clusters in open vugs. Some of the clusters were found as unattached “floaters,” covered on all sides by crystals to 3 mm. Most of the massive grossular was fractured along the pocket zones, but the integrity of the deposit is otherwise consistent throughout, with little disturbance by adjacent geologic features. There was one 5-cm-wide, clay-filled fracture that cut vertically through the occurrence. Virtually all specimens showing isolated

Figure 1. Location map.

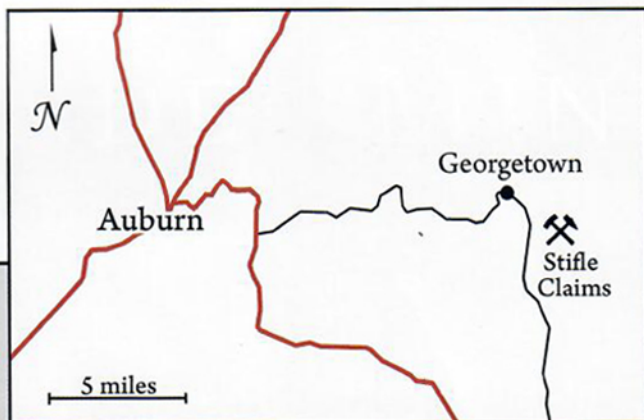


Figure 2. Eric Spencer at the bottom of the productive zone in the white grossular lens. The benches in foreground outline some of the later-stage fracture zones that had the good crystals. Len Pisciotta photo, 2018.



crystals were found in clay filled pockets and fractures. Very few undisturbed pockets of grossular with high luster were recovered.

Many of the open pockets in the lens were filled with loose, single garnet crystals, 1 to 2 mm in diameter. About 10% of the garnet crystals are sharp and well-formed, and only 1% show well-formed, clean crystals over 4 mm in size. A few rare crystals over 6 mm were found. The grossular crystal habit is generally trapezohedral. Roughly 90% of the crystals are slightly etched; 10% are lustrous, usually with striated faces and occasionally showing modifications by other forms.

Some specimens exhibit good coverage by 3-mm to 5-mm crystals. Virtually all specimens showing isolated crystals were found in pockets and fractures. Very few undisturbed pockets with highly lustrous crystals were recovered, and few specimens that occurred along fracture zones have good luster, larger crystal size and unetched faces. The best crystals formed on fracture surfaces cutting the main grossular mass.

The entire deposit consisted of interlocking fragments that could be easily removed. About 1,200 grossular specimens were recovered, from thumbnail to cabinet size, plus a few large cabinet-size pieces, and about five large plates. The largest pieces extracted weigh about 16 kg. The largest garnet crystals from this find are slightly larger than those reported by Pabst (1936). Most of the specimens were sold to Pu Tsu of The Uncarved Block dealership.

Fluorescence

Many of the white grossular crystals show some degree of fluorescence. The best specimens have 5-mm crystals with a bright pink-orange fluorescence under longwave ultraviolet light. These were collected along fracture zones that represent a late stage in the formation of the lens. Crystals along these zones are variably non-fluorescent to highly fluorescent, but almost all crystals exhibit some fluorescence under longwave ultraviolet light. None of the specimens fluoresce under shortwave ultraviolet light.

It is interesting to note that white grossular from the Jeffrey quarry in Quebec fluoresces orange under longwave ultraviolet light as well, but it fluoresces pink under shortwave ultraviolet light (Robbins, 1983).

Analytical Results

Initial identification of specimens was made by David Lowe. John Attard (Attard XRD Services) performed X-ray diffraction and X-ray fluorescence analyses on samples of white garnet, confirming the identification of the crystals as grossular, $\text{Ca}_3\text{Al}_2\text{Si}_3\text{O}_{12}$, indicating pure end-member grossular with only trace amounts of iron—enough, apparently, to poison the fluorescence in some crystals but not in others. Iron is known to be one of the elements that inhibits fluorescence (Robbins, 1983).

The microprobe analysis by John Attard, and a comparison with that of Pabst (1936) and with the ideal end-member composition, is shown in Table 1.

ADJACENT VEINS

No prehnite, chlorite or augite have been found within the grossular lens described here; it consists almost entirely of grossular, with minor amounts of disseminated psilomelane. The lens is surrounded by serpentine with relatively pure, massive veins of vesuvianite with chlorite. Two 30-cm vesuvianite vugs were found to contain excellent transparent, green to yellow-green vesuvianite crystals

Figure 3. Floater covered in small, white grossular crystals, 15 cm, from near the Stifle Memorial claim. Len Pisciotta collection and photo.



Figure 4 (bottom right). White grossular crystals to 7 mm on matrix, from near the Stifle Memorial claim. Len Pisciotta collection; Jeff Scovil photo.

Figure 5 (below). White grossular crystals to 7 mm, from near the Stifle Memorial claim. Len Pisciotta collection; Jeff Scovil photo.





(facing page, top) Figure 6. Floater covered in small, white grossular crystals, 5.1 cm, from near the Stifle Memorial claim. Pu Tzu (*The Uncarved Block*) specimen; Jeff Scovil photo.

(facing page, bottom left) Figure 7. White grossular crystal, 4 mm, from near the Stifle Memorial claim. Len Pisciotta collection; Jeff Scovil photo.

(facing page, bottom right) Figure 8. White grossular crystal, 2 cm, from near the Stifle Memorial claim. Len Pisciotta collection; Jeff Scovil photo.



Figure 9. White grossular "floater" group, 1.5 cm, from near the Stifle Memorial claim. Len Pisciotta collection; Jeff Scovil photo.

Figure 10. Vesuvianite crystal, 3.5 cm, found adjacent to white grossular lens. Four gemmy crystals of this size were recovered. Len Pisciotta collection; Jeff Scovil photo.

Table 1. Analyses of white grossular from the Stifle claims (in weight percent) in comparison to the ideal pure end-member composition.

	Pabst (1936)	Attard	Ideal
SiO ₂	39.3	39.72	40.01
Al ₂ O ₃	21.93	21.65	22.64
Fe ₂ O ₃	0.80	—	—
Cr ₂ O ₃	0.13	0.00	—
FeO	0.23	0.24	—
MnO	—	0.17	—
MgO	trace	0.00	—
CaO	37.10	38.21	37.35
H ₂ O	0.30	—	—
Total:	99.84	99.99	100.00

from 1 to 3.5 cm long, associated with large chlorite crystals to 5 cm. Only the two such pockets were found.

ACKNOWLEDGMENTS

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Eric's dog Rocksee for stumbling onto this occurrence, as neither of us would have found it without her help.

REFERENCES

- PABST, A. (1936) Vesuvianite from Georgetown, California. *American Mineralogist*, 21 (1), 1–10.
- ROBBINS, M. (1983) *The Collector's Book of Fluorescent Minerals*. Van Nostrand, New York, 289 p. ☒