GEOLOGICAL NOTES

HARTS RANGE HESSONITE GARNET OCCURRENCES

NORTHERN TERRITORY

AUSTRALIA

EL 4976

R. Grasso, M.Sc., F.G.A.A.

OPEN FILE
Two hessonite garnet occurrences were briefly visited by the writer in July, 1986. Both localities are within 5 kilometres of Coggan Bore, in the Harts Range of the Northern Territory; about 290 kilometres by road from Alice Springs. Access to the area is via a track off the Plenty Highway, approximately 19 kilometres east of the Harts Range Police Station. (near the Atitgere Aboriginal Settlement)

The Harts Range metamorphosed rocks are well known for gem deposits. In addition to garnets, the area has produced zircon, aquamarine, ruby, Iolite, black tourmaline, quartz (clear, rose, smoky and citrine) kyanite, epidote, apatite, amazonite, moonstone and possibly many others. Also, mica, (from many diggings throughout the range) gold, (Arltunga Gold Field) scheelite and molybdenite (Molyhil) and copper-lead-scheelite (Jervois) have been mined from time to time.

Geologically, the garnets occur as crystals and crystalline aggregates in metamorphosed calc-silicate rocks within the Irindina Gneiss Formation. This is an old formation of early Proterozoic age, and belongs to the Arunta Block metamorphic sequence. The metamorphism, which has been dated 1,800 million years is classified by Shaw & Freeman as having a grade of metamorphism between upper amphibolite facies to granulite facies. In contrast, the Harts Range pegmatites (carrying the muscovite mica, beryl and feldspar) are said to have been emplaced during the Alice Springs Orogeny; a period of mountain building activity, thought to have continued into Carboniferous time.

The hessonite garnets belong to the GROSSULARITE family, Ca₃Al₂(Si₄O₁₁)₂; in which ferrous iron may replace some of the calcium and ferric iron some of the aluminium. Generally they have a hardness of about 7 on Mohs's scale, a specific gravity of approximately 3.65, a refractive index varying between 1.742 and 1.748 and a dispersion of 0.027. The Harts Range hessonites range in colour from almost colourless through light and medium brown to deep red-brown.

As the Harts Range hessonites are badly fractured and contain inclusions, only a few stones have so far been cut that weigh more than 2 carats. Unfortunately the situation is made worse, by the fact that "mining" of many of the stones is by hammer and chisel; thereby contributing to more fractures. Alluvial stones shed from adjacent calc-silicate rocks were found in the southern occurrence; but these too are highly fractured.

Future exploration should lead to the discovery of other garnet (and possibly hessonite) mineralisation in the nearby area, as calc-silicate members are known to be reasonably common within the Irindina Gneiss Formation.

R. Grasso.
LOCATION OF HARTS RA. HESSONITE GARNET OCCURRENCES
REFERENCES


Webster, R., 1970: Gems, Their Sources, Description and Identification.

Hessonite is a variety of Grossular belonging to the Garnet mineral group. The refractive index and hardness as well as its colour range lend to its suitability to be fashioned into gems for jewellery purposes.

The material currently being extracted from the Harts Ranges comes in the form of dodecahedral crystals. Some crystals weigh up to 400 gms, and come in a variety of colours ranging from dark orange-red through to colourless. Five basic colour groups can be quickly identified in most parcels of rough. However in all the surface deposits worked so far all crystals have been found to be heavily fractured, such that any gem rough has to be carefully sorted. Even the most careful selection does not guarantee rough that is free from such things as cracks, inclusions, and healing fractures. Such items must be excluded or subsequently removed to produce saleable eye-clean gems.

Clean gems are bright and display strong colour and as such are the same as hessonites from other world localities in Africa, India and South America.

MURRAY THOMPSON F.G.A.A.
Dear Sir,

Please find enclosed photos and a description of the country in the area of F.L. 4976. There are outcrops of quartz scattered throughout and varies from flat country to small ridges and creeks, the majority high ranges. It is scrubby and very barren and in other places rocky. The large amount of the area consists of Metamorphic rock structure.

Sample areas as shown on map: in addition to mining claim marked 1. Large variety of colours available, ranging from pale yellow to deep orange, gem quality.

Areas 2 & 3, consists of dark orange and some gem quality.

Areas 4 & 5, and marked red, consists of yellow and dark orange garnet, some gem quality. The above areas being in hilly country and workable and accessible to machinery. Mining claims are intended to be put over areas 4 & 5, 2 & 3 will be considered for claiming after further exploration.

Areas 6, 7 & 8 marked black, are on high ranges and are accessible only by foot, however gem quality garnet is available in these areas, also it would be extremely difficult to mine except by hand, and could be kept in mind for possible future fossicking areas, especially area 6 as is just south of Coggan Bore, and easy to get to.

Area 9 marked green, is a smokey quartz location of gem quality, but further exploration is required.

Area 10 marked Blue, Crystal quartz, further exploration is also required.

Regarding information on the quality of the Hessanite Garnet, we have arranged an Analyst report from Adelaide, which we will forward to the mining register here in Alice Springs, immediately on receiving it, we expect this report within the next week.

We hope you find this added information to be enough, but if not, please contact us and we will supply you with whatever more you require.

Yours faithfully,

[Signature]

[Received 11:30 am 12/12/87]

[Stamp]
Coggar Bora location
(camp site)

Site of Claim
M.C.S. 66
Area Around Claim.
N.C.S. 66.
Road To Coggan Bora Location.

Area Around Claim.
M.C.S. 66