

Item 10

To: V. E. Scheid

From: Arthur Baker III

Subject: Mr. Vic Smith's "blue opal"

Memorandum

UNIVERSITY OF NEVADA
Reno, Nevada

Date: April 8, 1969

Attached is my suggested draft of a reply to Mr. Smith concerning the "blue opal" from his property 8 miles SW of the Argentite Mill.

5400 0009 Also attached for your files are Mr. Smith's letter, and the reports by Dr. Hsu and Mr. Murphy as to their findings, on which I based my letter. They did a very thorough job of examination and reporting.

From Mr. Smith's description of the location, and from my knowledge of the country, I am reasonably sure that the property is in approximately Section 3, T. 4 S., R. 38 E., somewhat south of the Silver Peak district. With the expectation that this question will arise again eventually, I'm putting copies of the Hsu and Murphy memos into John Schilling's public files of mining district information.

cc: L. C. Hsu
J. B. Murphy

Blind note for files: Argentite Mill is presumably the one in Silver Peak (now used by Foote Minerals for lithium plant). Smith's letter states the property is in Esmeralda Co.

ABIII



To: Arthur Baker III
From: J. B. Murphy
Subject: Smith material for identification

Memorandum
UNIVERSITY OF NEVADA
Reno, Nevada

Date: April 8, 1969

A petrographic thin section was made of the blue material that Mr. Smith refers to as "Blue Opal."

Optical Determinations:

Relief: Low, N = Higher than balsam. (Opal N = Lower than balsam)

Cleavage: None

Birefringence: Low. 1st order white to straw color. (Opal none)

Alteration: None

Form: Microcrystalline (Opal is amorphous)

Physical Test:

Blue Material is not scratched by opal
Blue Material scratches opal
Blue Material does not scratch quartz X 1
Blue Material is not scratched by quartz X 1
Blue Material does not scratch topaz
Blue Material is scratched by topaz

Conclusion:

Material has a hardness of 7 Moh's and is sufficient proof in itself that the material is not opal. Optical determinations prove material to be crystalline. Opal is an amorphous substance not crystalline.

The blue portion of the material examined is of lapidary quality and would be defined as "Blue Chalcedony" within the lapidary trade. The coloring is not of sufficient intensity to create any great interest among professional lapidarists or in the gem trade. The material may be of interest to the amateur gem cutter. This could be determined by sending a sample (one or two pounds) to Grieger's Inc., 1633 E. Walnut St., Pasadena, California.

Federal laws regulate truth in advertising within the gem trade. A seller of this material if advertised and sold as "Blue Opal" would be subject to these laws under fraud.

To: Arthur Baker III

From: L. C. Hsu

Subject: Comments on Vic L. Smith's Specimen

Memorandum
UNIVERSITY OF NEVADA
Reno, Nevada

Date: April 8, 1969

Optical Study:

Thin section including the clean blue portion and the brown shade of the specimen was prepared. Except several small parts of the section show fibrous and spherulitic interference figure characteristic of cryptocrystalline (between amorphous and crystalline) material, most parts of the section show tiny crystals (several microns and smaller) tightly packed in interlocking and graphic nature, which may as well be called microcrystalline (because of small grain size) rather than cryptocrystalline.

The brown shade or color of the specimen is mainly due to limonite staining which was precipitated from iron-bearing solution when it diffuses through and from the cracks of the specimens to the neighbors.

Indices of refraction, though not determined in detail, are clearly above (slightly) 1.535, in contrast to index of refraction of opal which is supposed to be around 1.43.

X-ray Diffraction:

The blue clean portion of the specimen was taken to make into powder for x-ray diffraction. The diffraction pattern is essentially identical to that of quartz both in intensity and reflection peaks. From x-ray, this specimen may as well be called quartz; it is by no means anything like opal.

Heat Treatment:

To obtain the H_2O content of the specimen, the blue clean portion of the specimen was crushed into powder and subjected to heat treatment.

Weight loss after heating at $105^\circ C$ for 14 hrs.

i.e. H_2O^-

$$\frac{0.0165}{8.4445} \times 100 = 0.195\%$$

Weight loss after heating at $1000^\circ C$ for 7 hrs.

i.e. H_2O^+

$$\frac{0.0643}{8.4280} \times 100 = 0.763\%$$

Total H_2O content is 0.958% in contrast to the ordinary H_2O content of 3 to 9% in opal.

In conclusion, mineralogical studies indicate that the specimen should be blue chalcedony rather than blue opal.