

GEMOLOGICAL DIGESTS

Mexican Black Opal

Mexico has long been famed among gem connoisseurs for its "water opal." Due to its rarity this stone does not compare with the Australian opal and is chiefly of interest as a collector's item. Even less known, however, is a variety of black opal from Mexico, which the writer obtained on a recent visit.

The Mexican black opal is a true opaque black, containing abundant, though slightly subdued, fire; it is free of the matrix which characterizes the Australian variety. Due to its novelty, the value of this Mexican opal has not been definitely established.

Everyone who handles opal can tell tales of the stone's sensitivity to heat and dryness; opals sometimes crack or break with seemingly little cause other than their innate perversity. Yet the Mexican black opal is actually raised to a red heat by the native lapidaries in order to improve its brilliance, without the stone suffering damage.

When first taken from the ground, the opal is a creamy white color and shows relatively little fire. In order to darken it and bring out its latent fire, the Mexican lapidary employs the following process which the author was privileged to observe closely.

Process for Baking

(1) The rough opal is cut into finished, polished stones and from among these are selected those suitable for baking. In order to with-

stand baking without breaking, a stone must be opaque in appearance, as opposed to the glassy or translucent color usually associated with opals. Such opaque stones are usually a trifle porous as well. The ability to choose correctly comes only with practice.

(2) A very fine-grained baking earth is compounded by mixing dust from the opal-cutting operations with finely pulverized fertilizer. This causes the earth to have cohesion; it resembles in texture the molding sand used in fine silver casting.

(3) The opals and the baking earth are spread in the patio early in the morning and allowed to remain in the sun until mid-afternoon. This drives off excess moisture and warms both opals and earth evenly.

(4) A small (1 pint) spherical earthenware pot is half filled with the warm baking earth and evenly tamped. The opals are placed on top of this layer, then the pot is filled with the remainder of the earth and again tightly tamped. It is important that the tamping be thorough, otherwise the opals will heat unevenly and may break.

(5) The lapidary now places the pot deep in a bed of hot charcoal, on which the family supper is usually cooking, and goes off for a short siesta or to the near-by church to offer a prayer for the health of his black-opals-to-be; the cooking of opals is not so certain a thing as to cause one to lightly spurn divine assistance.

(6) Approximately 20 minutes after placing the pot in the charcoal, the lapidary removes the vessel, which by now is a bright cherry red; a blue flame may play around the mouth of the pit due to the emission of gas by organic material in the baking earth.

(7) The pot of opals is allowed to cool indoors until the following morning, when the earth is unceremoniously dumped into an ordinary kitchen strainer and the opals sifted out. This process is not devoid of interest, as it may reveal a batch of fine stones or only a heap of worthless fragments. The baking has turned the earth as black as soot and destroyed its cohesiveness. It is used only once.

The process which causes the opals to darken is not clearly understood and would be an interesting subject for study.¹ The explanation is probably to be found in the reduction of carbon within the stone; but whether the carbon was originally present within the stone or whether it is introduced by the organic vapors is not known.

The fact that these opals withstand such intense heat with relatively little breakage and show a marked increase in brilliance is of considerable interest. It would seem that the play of colors so typical of opal is, in this stone at least, independent of casual water content in the stone's interstices and due entirely to the optical configuration of the opal proper. It would be interesting to determine the water content of these opals before and after heating.

—Dan E. Mayers

¹Subsequent to writing the above, the author discovered that the blackening of the opals described was only "skin-deep," the stone turning white once more on being repolished. This shows rather conclusively that the coloring is caused merely by the deposition of soot in the pores of the stone near its surface.

Notes on Cutting and Polishing Scheelite

Scheelite is difficult to polish, which indicates that it has a high melting point. This, combined with a high coefficient of expansion, makes high pressure and lap-speed in polishing impossible. This drawback to its use as a gem is partially offset by its high dispersion and strong double refraction.

I have obtained interesting results in cutting and polishing a white scheelite reported to have come from southern California.

Polishing was, at first, difficult. Under a high-speed felt buff the material heated and shattered badly. An excellent polish was eventually obtained on cabochon forms with very fine levigated alumina on a hard felt buff, wet, with the slowest speed on a jeweler's polishing motor.

Flat surface polishing in a brilliant-cut scheelite presents a much more difficult problem. An excellent example of brilliant-cut scheelite was fashioned for me by Mr. A. Esposito, of Larchmont, New York, who roughed out the piece to the approximate proportions for a full cut brilliant of about the size of a 3- or 4-carat diamond.

In polishing it, with a view to obtaining a maximum amount of total reflection, Mr. Esposito tried everything—even to a very fine levigated diamond dust—without being able to arrive at anything which would give it a fine polish without cracking it, so that it still appears a bit milky.

If any method could be found to give colorless, brilliant-cut scheelite a high polish, a most lively brilliant would result. Though not of sufficient durability for use in jewelry, such a stone would make a fine museum piece.

—Frank B. Wade