International School of Gemology

17 April 2008

Sunrise Over Oregon

I've never seen an Oregon sunset. But I understand that there has been far more sunsets than sunrises in the past couple of years for the Oregon sunstone mine owners. Mainly because of claims by Far East dealers to have found the same type of labradorite feldspar in several Asian locations that occurs in Oregon, and the selling of this cheaper material to several major television shopping channels. This has resulted in some dark times for the Oregon mine owners over the past 2 years. Well, its time to start listening for the roosters to crow, because there is about to be a **Sunrise Over Oregon.**

The History

In 1980 a unique discovery was made in the US state of Oregon , an unknown type of labradorite feldspar that was colored by granules of native copper that existed as inclusions in the labradorite. This new gemstone was named Oregon Sunstone. And for the past 28 years the Oregon Sunstone mine owners have worked very hard to produce enough material to establish a nice market with this unique gemstone. The Oregon labradorite offers not only the shiller effect sunstone with the glitter of the sun giving it the name, but also some rare red and green forms of the labradorite, also colored by copper, that offered even more unique properties. A new gemstone market was born, and what made it even rarer was that this gemstone market was one of very few that was completely unique to the United States mainland.

The problem

As with all new gemstone finds, many people wanted to cash in on the new market and its profits. Some thought they could find other sources of the Oregon type of labradorite. They could not. So they decided to create a look alike. And since labradorite is a member of the very large feldspar family of gemstones, it was easy to find other members of the feldspar family that could be made to

emulate this rare labradorite from Oregon . Or so they thought…….

The science according to cake

The feldspar group of gemstones is known as an isomorphous replacement series. This means nothing to most people. But think of the feldspars like you would to bake a cake. Some want chocolate, some want vanilla, and same want in between. If you are baking a cake and put in all chocolate, you get a completely chocolate cake. Same with vanilla. But if you put in 90% chocolate and 10% vanilla, you will get a cake between chocolate and vanilla. It will be more chocolate than vanilla. And be more brown than white. We will call that cake an oligoclase cake. Now, if we change the recipe to 30% chocolate and 70% vanilla, we will have a cake that is far more vanilla, and be far whiter in color. We will call that cake a labradorite cake.

The two cakes will still be cakes. But what went in to make the cakes will be different, and the look and taste of the cakes will be different.

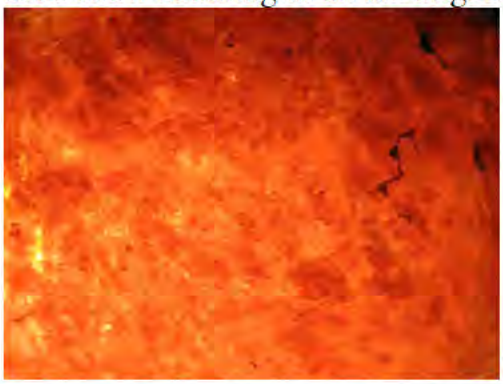
Now, what if you could find our oligoclase chocolate cakes just anywhere and they were not that expensive, but the labradorite white cakes were rare and very expensive? We would want to make our oligoclase chocolate cake look like the labradorite white cake.

We could put a whole bunch of white icing on our oligoclase cake and tell everyone it's a labradorite cake. And based on the outside, no one could say for certain that the cake was not a labradorite cake. But once you cut it and looked inside, you could easily determine that you did not have a labradorite vanilla cake. Once you cut it and looked inside you would easily be able to tell that you had an oligoclase chocolate cake.

That, is what we did. We cut the cake and looked inside. And you know what; it is not a vanilla labradorite cake at all. Here is the evidence.

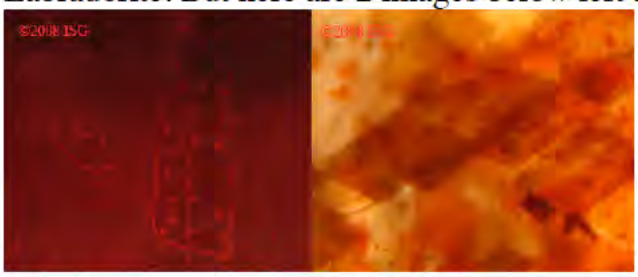
Inclusions

The original sunstone is an oligoclase feldspar colored by platelets of hematite. They are easy to spot due to the hematite platelets inside the stone which cause the sunstone effect. Below you can see a slide show zooming in on the oligoclase feldspar sunstone that is very cheap and very available.

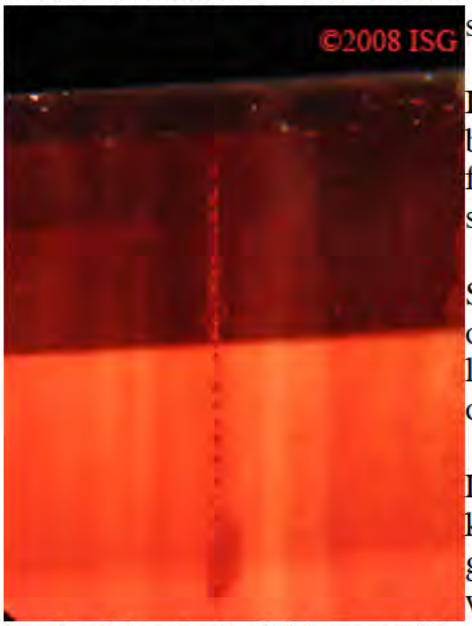


The platelets you see are unique to this type of oligoclase feldspar. But wait, we purchased what was represented to be Andesine Labradorite comparable to the Oregon material from a major television shopping channel. Their documents called it Andesine

Labradorite. But here are 2 images below left and center.



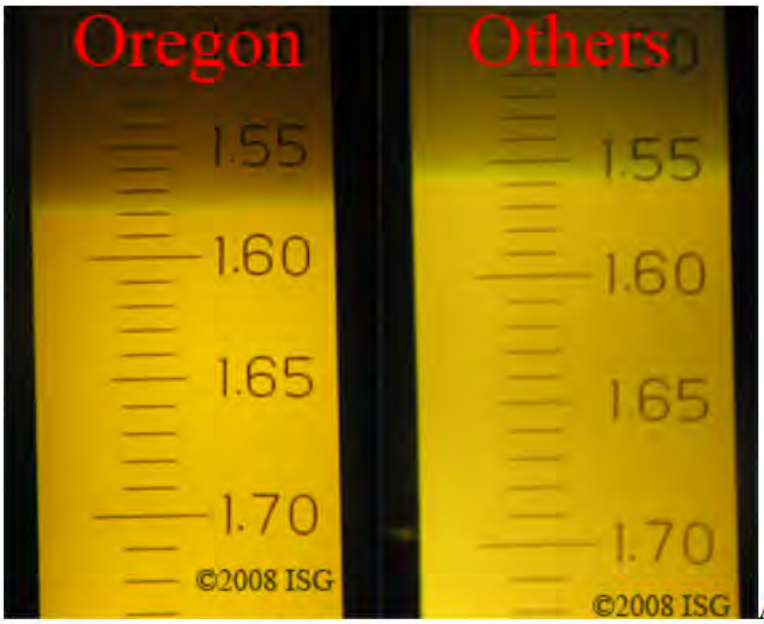
Look at the first image at the top of the page with the row of stones. We are looking at the red stone on the far left. This is the red Andesine Labradorite sold to us by a major television shopping channel, and you can see two microphotographs in the first two images above left and center. The third image above right is the cheap Indian sunstone. An exact match for inclusions. Could our expensive Andesine Labradorite really just be treated cheap Indian sunstone? But there is more.



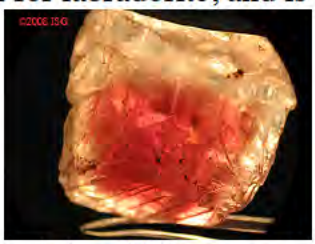
If you look at the image at left of this same stone you see a surface breaking fissue that appears to have a red coloring filler. And in fact this stone has three such surface breaking fissures, and all show this same type of feature.

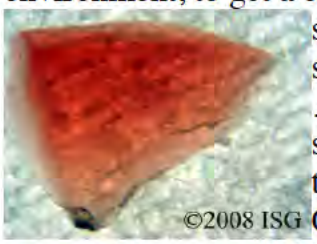
So we first have inclusions that are unique to inexpensive oligoclase feldspar instead of inclusions that would indicate a true labradorite. And next we have what appers to be a strong indicator of color treatment. But let's go further in cutting this cake.

Let's go do some basic Gemology 101. Let's test this material. We know that the feldspar gemstone group has some variables in the gemological properties. Oligoclase feldspar is biaxial negative, while labradorite feldspar is biaxial positive. And according to the books, labradorite feldspar will have a significantly higher refractive index than the oligoclase. So let's throw a few stones on the ISG refractometer and see what we find. Below you see two readings. The one on the left is of the Oregon Labradorite Sunstone material. The one on the right is from the shopping channel's claimed Andesine Labradorite.



And you know what, the Oregon Labradorite Sunstone is indeed biaxial positive with an average reading in the 1.57 to 1.58. But the television shopping channel's supposed Andesine Labradorite is1.52 to 1.56 RI and is biaxial negative. That's not labradorite we got from the shopping channel. But what is it? So far, the television shopping channel material has oligoclase inclusions, is below the proper refractive index for labradorite, and is optically negative while labradorite is optically positive. Let's continue. Because of the way it forms, true Oregon Labradorite Sunstone cannot be cut with a colorless center. Cannot be done. Look at the image at right and you can see why. It forms like a piece of candy with the red interior and colorless exterior. So you could cut it with one half colorless, or top or bottom colorless, but not the interior colorless and the outer edges colored. That would require you to take colorless material and treat it, perhaps by heating it in a high copper environment, to get a colorless center since the treatment might not go all the way through the stone. So how do you find out…..you take a hammer and break one of the stones. At left you see a piece of a stone from the Congo in an immersion cell . The red color is intense at the facets at the top of the stone, but as you can see, the bottom point is from the center of the stone. It gets quite colorless in the center. Treated stone? We don't know. But we do know that true Oregon Labradorite Sunstone could not show this condition. There is a lot more evidence available on this subject. I am sort of surprised that there has been such a brouhaha on this topic as the differences in the true Oregon Labradorite Sunstone and the imitators is really rather elementary gemologically. Hematite platelets are only going to occur as we saw them in the oligoclase Indian sunstone, not the Oregon gemstones. And if you consider the gemological properties of optic sign and refractive index, this should all add up to an easy separation of the true Oregon Labradorite Sunstone from its imitators. And here is the real kicker….. We tested eight (8) specimens from various locations all claiming to be comparable to the Oregon Labradorite Sunstone. And every single one, every one, tested out at the lower RI, negative optic sign, and/or inclusions that did not match. Not a single emulator demonstrated any actual property of the true Oregon Labradorite Sunstone. But we will keep looking. Until then, here are a few images below of the real thing. First is looking inside a red/green Oregon stone at the color boundary showing some of the





native copper granules in the lower left. And finally is a slide show of one stone. One stone. Showing the rare and remarkable intense green to red pleochroism of this beautiful rough Oregon Labradorite Sunstone. This is unique to the Oregon material. And it's not a color change due to lighting. This is simply looking at the stone from one

direction, and then the other. I hear them roosters crowing. The sun is coming up over Oregon . And that Oregon Labradorite Sunstone has a brand new shine on it from where we can see down here in Texas . If you have questions about this or any topic relating to gemstones and gemology we invite you to join us in the ISG Student Forums Boards to learn and share with us. **With appreciation:** To Lisa Brooks-Pike, RGA, of Gem 'n I - Gems for bugging the crap out of me for over a year to take a look at this Oregon Labradorite Sunstone issue. Lisa was the moving force behind this report and helped collect a lot of the Far East wannabe specimens. Perhaps now I can get some rest. To Martin Guptill, FGA, GG, for providing hand dug rough specimens of Oregon rough and cutting windows in it so we could properly test the rough material. To John D. Woodmark of Desert Sun Mining and Gems for trusting us with a boat load of rough Oregon Labradorite Sunstone so we could establish sufficient test numbers to provide the evidence on the Oregon material. And to the many television shopping channels who have raised the level of awareness of colored gemstones to the world markets. We are not picking on you. We want to help you avoid this kind of thing in the future. Its really simple stuff, this gemology. You just have to take some time. And to the ISG Student Body. This is a perfect example of why you don't sit around and try to figure out what something is. You figure out what its not. Once you do that, gemological identifications become easy.

For more information on the ISG training programs please visit the ISG website at www.SchoolofGemology.com.

Robert James FGA, GG. Pres. ISG

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