Labradorite gemstones and related ornamental stones from the type area on the coast of Nunatsiavut (Labrador), Canada

Andrew Kerr
Memorial University, Earth Sciences, Canada (akerr@mun.ca)

Labradorite is an unusual gemstone in many respects, despite being a variety of plagioclase feldspar, probably the most common mineral in the Earth's crust. Calcic plagioclase is common in mafic igneous rocks, especially gabbros, norites, troctolites and anorthosites, but it is generally unremarkable in appearance. However, gem labradorite exhibits striking colours on cleavage surfaces when viewed from exactly the right direction. Intense blues and greens are most common, but shades of brown, yellow and red also occur. This phenomenon results from optical interference effects caused by microscopic exsolution lamellae that have very specific and consistent thicknesses. This special type of iridescence is termed ‘labradorescence’ because it is very specific to this mineral. Labradorite was one of the earliest gemstones to be recognized in Canada, first collected by a Moravian missionary around 1773, and named by the famous mineralogist Abraham Werner in 1780. However, it was noted long before this, as there is an Inuit legend about the Northern Lights becoming imprisoned on the rocky coast of Labrador. The typical blue and green colours of the stone are indeed reminiscent of the auroral displays for which the region is famous.

In its type area around the town of Nain, labradorite is hosted by massive anorthositic rocks that are regionally extensive. The anorthosites generally contain > 90% plagioclase, with lesser pyroxene, olivine and Fe-Ti oxides. Labradorescence is variably present in the feldspars, and small pockets of bright colour occur sporadically within otherwise unremarkable rocks at many locations. More extensive gem-quality labradorite is associated with very coarse-grained (pegmatitic) zones, and several attempts at exploiting such material were made at a location now known as Tabor Island. Another well-known location in an inland area is appropriately known as “the Pearly Gates”, but this remains unexploited. Coarse-grained, equigranular anorthosite containing 5-20% iridescent feldspar was quarried for dimension stone near Nain intermittently for about 20 years, and was marketed under the trade name ‘Blue Eyes’. Much potential remains for future production of stone of this general type in the Nain area, although the remote location and climate present logistical challenges.

Labradorite also occurs in many other places, and sources of significance include Norway,
Finland, Australia and the island of Madagascar. Scandinavia is famous for the dimension stone known as Larvikite or “Blue Pearl”. This is a feldspar-rich monzonite that contains much iridescent plagioclase, but is darker in colour than typical Labrador anorthosites. Madagascar provides much of the material now used for craft purposes, even in the northern region where the mineral was first recognized. However, labradorite-rich stones are now being used by Inuit carvers, in addition to more traditional materials such as soapstone and serpentinite.

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