grasshopper
TULAMEEN Palladium-Platinum-Gold PROJECT,BC

The world demand for PGEs is growing and many producers are increasing production, nevertheless, the uncertainty of delivery of some of the conventional supplies have initiated large price hikes and therefore a new interest in other sources of PGEs. BC contains areas which are very interesting from this viewpoint. Although the only major production of Pt in BC was from placers around Tulameen, the possibility of finding lode deposits have mentioned for nearly a century.

The Grasshopper working group provides:

- Land
- Expertise
- Experience
- Proven Track Record

The Grasshopper Land holding is a property of merit and consists of 38 claims located north and west of Princeton, BC. centered on Grasshopper Mountain and straddling the PGE fertile ultramafic Tulameen Complex from the Tulameen River to north to Murphy Lakes (NTS 92H10).

The working group includes Les Allen, owner of record of part of the Grasshopper Block, and longtime prospector; Ron Bilquist, owner of record of part of the Grasshopper Block, also a longtime prospector; Dr Tom Richards, P. Geo., well known BC grassroots explorationist, and Dr Mikkel Schau, P.Geol., with experience in PGE deposits from northeastern Canada.

The area is easily accessible. Claims are well served by local and regional roads. Princeton, Merritt, and Kamloops are logistically well equipped town; both Tulameen and Coalmount are smaller but adjacent and convenient to the claim group.

Elevations in the Intermontane region are such that snow covers the area from late October to early April. Higher regions are covered longer. The area is diverse and shows the usual intermontane ecosystems.

A century ago, placers produced gold and platinum from the Tulameen River and many of its tributaries. Official records indicate that at least 20000 oz. Pt. were recovered from the general area. Although many have searched for the source of this Pt, no mother lode has been found as of yet. Only microscopic flakes have been found in situ in chromite segregations, but there is general agreement that the larger Pt nuggets also stem from the chromite, olivine, or, less likely, pyroxene rich parts of the complex.

The Tulameen placers are reported to have produced mainly Pt and scarce Pd. This is a feature shared with many placers from complexes such as this. Elsewhere it has been suggested that the Pd has been differentially dissolved away. That this is plausible explanation is borne out by the finding that Pd is common in some of the rock types of the complex. It would seem that Pt was concentrated in certain rock types such as chromitite, and dunite and Pd in others such as hornblende pyroxenite along the outside of the core. Initially, the whole complex is thought to have contained about equal amounts of Pt and Pd. Differentiation in the magmatic and hydrothermal realms have initiated the separation. And upon weathering, only the Pt remained refractory and stayed in the placers. It is entirely possible that with more work that Pd minerals will be found in the Hb pyroxenites.

The differential solubility of Pd and Pt has long been known to chemists, but that this difference might have important geological repercussions is not widely appreciated in the literature of economic geology. As late as 1998, academic researchers were still discussing basic chemical questions, and the consequences of a decade's worth of new work has yet to infiltrate economic geology. In general, in oxidizing and acid environments, precious metals are all soluble, but Pt is the least so. In chlorine rich solutions, all precious metal elements form complexes, and in sulphide rich solutions all the elements are also soluble. These solutes are all part of possible types of ore forming solutions. Precipitation on the other hand is fav

oured by reducing
environments (such as serpentinized dunite). Although the economic association of PGEs with
large mafic bodies as components of immiscible sulphides and in magmatically formed "reefs" is
well established, the finding of PGEs in large hydrothermal systems is less well noted. Pd for
instance is found in the Au rich core of the Grassberg system, and an extensive but little known
list of hydrothermal occurrences have been accumulated over the years. Epidote is a local host
for Pd minerals in the Saltchuck Mine in Alaska (which is also a concentrically zoned ultramafic
pluton)!

The exploration history of the Grasshopper Claim Holdings is summarized by Bilquist in an
accompanying attachment. Briefly, Pt has been found in chromitite rich pods, and Pt and Pd
have been located elsewhere as shown in accompanying map.

The most comprehensive study, by David Bohme of Newmont, show promise of a Pt deposit, but
certain problems had to be resolved. In the Newmont Report Appendices it is suggested that the
metallurgical research be done before any more exploration proceed because the location of the
platinum is uncertain. In fact, small grains of platinum have been located mainly in chromites,
and in alteration veins cutting chromite, as well as in rare sulphide grains! A SEM picture is
shown wherein chalcopyrite is shown to contain Pt!! The new mineral, Tulameenite (Cu Pt ),
was first recognized at Tulameen and has been recognized to be a secondary mineral. It may
have formed due to a breakdown of platiniferous chalcopyrite in subsequent deuteric or
metamorphic readjustments. Certainly native (platinian) copper has been noted in altered
crevices or zones suggesting a similar breakdown reaction. Lack of money prevented resolution
of the problem.

Claims by Nixon et al, that the chromitites are the source of the platinum because the olivine
inclusions in Pt nuggets are the same (ie more magnesian) as the olivine in Chromitites and not
like that of the of the dunites are probably correct. Nevertheless the

mineralogy, size, and composition of the PG minerals is not the same in situ and in placer. The hint is that there was a lode source for placers.

Exploration strategies can be based on the high density of PGEs. Plant, soil, till, stream, and water sampling require a certain amount of adjustment to standard procedures to utilize the special chemical features of PGEs. Some pilot studies are published. Geophysical magnetic surveys can image the location of magnetite (as primary deposits (koswite), as serpentinized dunite (which carries much, but minuscule, magnetite), and provide locations for faults and other hidden contacts. Gravity, and conductivity studies could be used but in special, well-understood, circumstances.

There has never been a complex-wide multidisciplinary exploration program conducted over the whole complex. Prospectors have not swarmed over the complex for a long time, and new outcrops and roadcuts provide a new perspective on the bedrock.

The time is right.