Alumnae Update

From Linden to Queen's to the Real World: Golden Opportunities

By Gillian Gardhouse, Linden '04

Greetings from the summery southern hemisphere – north-central Chile to be exact!

After spending a year in Round Mountain, Nevada, I arrived in Chile in June 2009 to kick off my second year in Kinross Gold Corporation's Generation Gold program. Through this new graduate work program, Generation Gold employees have the opportunity to spend a year at four different mining operations in Brazil, Chile, Ecuador, Russia and the United States. The program was developed in 2007 to meet the increasing need for engineering, geology and business graduates, and recruits five new people each year. With my degree in Geological Engineering, I can effectively wear two hard hats as either a geologist or an engineer. At present, my skills are needed more on the geology side of things, which is how I ended up in Chile.

Gillian outside of the mine in Chile.

Kinross has two operating mines and several exploration properties in Chile. I work at La Coipa, a mine nestled 4,000 metres above sea level (masl) in the Domeyko Cordillera, a mountain range of the Andes. The mine is nearing the end of production, but despite nearly 20 years of ore extraction, there is still much to be understood about the geological nature of the deposit. My work has revolved around developing updated geological models of the area.

What do geological modelling and a loaf of bread have in common?

Let me explain the concept of geological modelling in simpler, more familiar terms. Imagine you're making a loaf of raisin bread. You've made the dough and have just added a pile of raisins when the phone rings, there's a knock at the door, and you smash a plate on the floor simultaneously. Not surprisingly, you forget to mix the raisins in. You plop the dough in the pan to rise, deal with the door, the phone and the broken plate, accomplish fifty million other pressing things in the time that the dough takes to rise and eventually stick it in the oven.

Only after it has been baked and is cooling on the rack while you smugly admire it with a mug of a warm beverage do you remember that there is a clump of raisins sitting somewhere in the middle of the loaf. Not to worry – you will just cleverly figure out exactly where the clump is, carefully extract it and innocently pretend that you had intended to make plain, raisin-less bread from the beginning.

To find the clump you make a hole into the loaf with a straw and extract a small sample. The first few samples include only the white bread, but as soon as you hit little pieces of raisins you are able follow your suspicions and situate the next holes where you think you will find even more raisins. However, to prevent your beautiful loaf from looking like a holey slab of Swiss cheese, you make only enough holes to give you a very basic idea of where the clump is.

Based on your samples, you build a picture of what the raisin body looks like by pretending that you have cut the loaf into slices. Each pretend slice includes the clues gathered from the holes you made with the straw. You correlate the raisin clues like a game of connect the dots to make a closed polygon. When you put the slices of bread back together to form a loaf, the polygons from slice to slice can be connected, essentially forming a three dimensional interpretation of what you believe to be the location and extent of the clump of raisins. You cut the bread with great precision, successfully remove the offending clump and share your fresh creation with your impressed friends and family.

And now, back to Chile

The analogy of finding the raisin clump in the loaf of bread is more or less what I've been up to, only the raisins are gold, the loaf is the Earth's crust, the data set includes hundreds of drill holes dating back more than thirty years, and the modelling is done with sophisticated software. The modelling process is repeated for different sets of data that have been gathered from the drill holes, including lithology (the characteristics and composition of rocks), alteration (a mineralogical change at low pressures due to invading fluids or the influence of oxygen), mineralization (the conversion of

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Tall Tidbit

Changes in air pressure related to altitude have some interesting implications for the human body. At sea level, where the elevation is 0 masl, the air pressure is 101.325 kPa, while at 4,000 masl the pressure is only 61.651 kPa. The Ideal Gas Law indicates that pressure and volume have an inversely proportional relationship – when one goes up the other goes down. So when the pressure decreases moving from sea level to 4,000 m, the volume of air increases – and this includes the air in our bodies.

Many employees at the mine experience headaches, dizziness, fatigue and breathing difficulties when they initially ascend to the mine. I'm generally plagued by plugged ears, mild headaches and sleeping difficulties (including incredibly crazy dreams). The good news is that the symptoms go away in a day or two, but for those of us who work a four day-shift it's time to descend just when we've gotten fully acclimatized. Over time you do kind of get used to the altitude, but you still can't fully overcome the Ideal Gas Law.

an organic substance to an inorganic substance), silver and copper quantities, and of course gold values.

When compared to earlier interpretations of the deposit, the new and improved model usually identifies more gold. This increase means that the mine can continue to operate and produce gold for longer than previously predicted – and that means that the approximately 800 men and women who work at the mine can keep their jobs for a while longer. By 800 men and women, I really mean that there are less than 15 women in professional positions, roughly 20 in unskilled labour and perhaps another 50 in the subcontracted support services that include cooking and cleaning. But regardless of who is bringing home the paycheque, mining is an extremely important contributor to the Chilean economy and the well-paying, secure positions are highly sought after. In fact, many of the people I work with travel great distances from their homes to the mine for their rotation of either four days or seven days.

Life in and out of the mine

I spent my first four months in Chile traveling about 1,000 km to the capital of Santiago whenever I had time off. However, in October, I officially moved to the city of Copiapo and now my travels are limited to the two-hour bus ride up to the mine. With a population of about 150,000, Copiapo is a gritty mining town surrounded by factories and farms. When I'm not at the mine I live in an apartment that overlooks the plaza de armas, or main square, which makes me privy to every fair, performance, wedding and protest in the city, along with the shouts of late-night revellers and the chorus of stray dogs. The highlight of my incredibly relaxed weekend is a trip to the local market where I buy kilos upon kilos of delicious fruits and vegetables grown in the region.

You may be wondering about the issue of language, as Chile is a Spanish-speaking country, and yes, all of my antics to date have been conducted in Spanish. And no, I did not take Spanish at Linden or at university – I began learning it through a computer program while still in Nevada and when I arrived in Santiago for the first time I had never actually had a conversation in the language with another human being. Needless to say, I initially spent a fair amount of time in a state of complete incomprehension. My supervisor at the mine speaks English, as well as my roommate and a handful of others, but my direct co-workers speak only Spanish. Chilean Spanish, or Castellano, is spoken rapidly and often without pronouncing certain consonants and - to further add to my confusion - it is also filled with modismos, or slang. In all, I have managed to negotiate public transit, return defective products to the store and generally prevent starvation, so I would say that my Spanish is progressing successfully.

Top 10 Things Not to be Taken for Granted in Canada

1. **Understanding and being understood.**
2. **Quality drinking water.**
3. **Effective and accessible recycling systems.**
4. **The absence of regular, small-scale earthquakes.**
5. **Large automatically igniting ovens with temperature dials.**
6. **The absence of stray dogs.**
7. **Two-ply toilet paper.**
8. **Fresh milk.**
9. **Cheddar cheese.**
10. **Real coffee (i.e. not instant!)**