Context:
Gabriola geology

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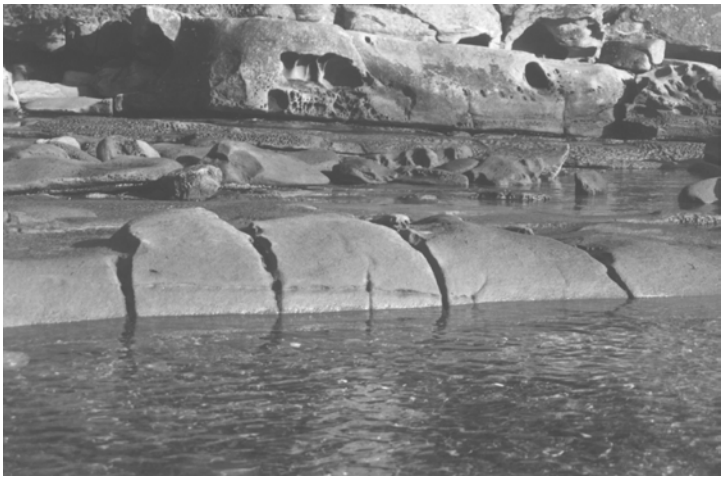
The geology of Gabriola's roads

by Nick Doe

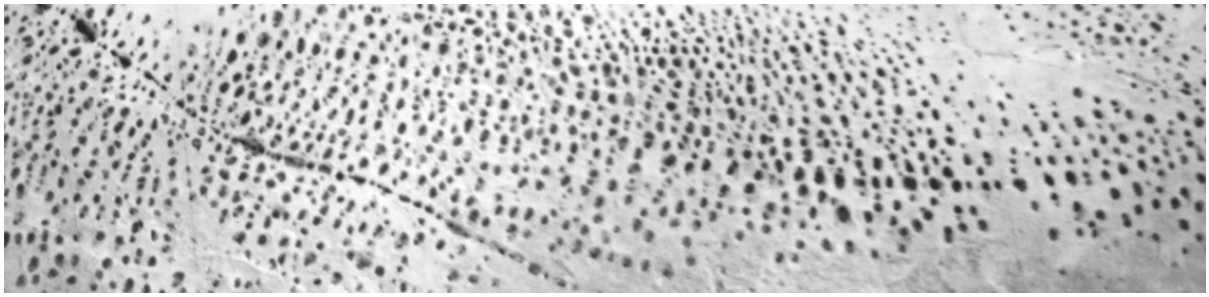
May 2004 was a bad month for those who study Gabriola's road surfaces. Lots of potholes and fractures, many of which took years to develop, were obliterated under tonnes of fresh asphalt without any attempt at preservation. Fortunately, a few details from the notebook of a road-surface researcher have survived and these will, in due course, be donated to the Gabriola Museum's archives. In the meantime, for the record, here they are.

Everyone knows that roads are built with a ∩-shaped profile so that they shed water. They're what geologists would call an *anticline* (the opposite of a ∪-shaped *syncline*). It is no surprise therefore that the folded road surfaces sometimes fracture. The long crack on the left of the picture is clearly a *tension fracture*, or what some would call a *longitudinal fold fracture*, because it runs parallel to the axis of the fold. Lots of fractures in Gabriola's sandstone rocks also do that.

The big question however is, what are those cracks in the yellow centreline? Are they *joints*, sloppy paintwork, or something else?



At first blush, *joints* seems a good answer. As the second photograph shows, they have them in Drumbeg Park, so why not in the middle of the road? But wait a minute! Shouldn't joints actually join something? Those cracks in the yellow centreline seem to have a life of their own—they're not obviously connected with the tension fracture as the ones in Drumbeg are.



I suppose they could be the result of sloppy paintwork, but that's a pretty boring reason. Instead, how about the notion that they are distantly related to the honeycomb holes in Gabriola's sandstone.

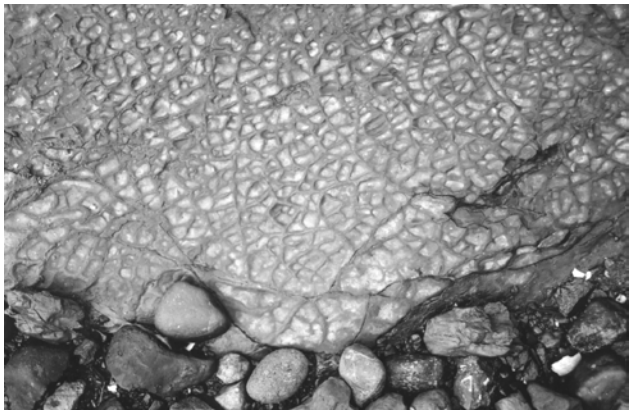
Here's how this theory works.

You must have noticed that although the honeycomb holes spread themselves out over the surface of the rocks, they also sometimes line up in lines, as in the photograph *above*, and that when they do so, they spread themselves out fairly evenly along the line—as the cracks in the yellow centreline do.

The reason they do this is that the holes in the sandstone are *service centres*; they allow water from inside the rock to escape when the rock gets hot in the sun. The holes are especially needed where the sandstone is fractured, or above a relatively impervious bed, because that's where the water in the rock likes to trickle. Like all service centres, the holes space themselves out equally because you just don't need two service centres close together any more than you do, say, two bus stops close together along a bus route.

So now, let's think about the cracks in the yellow centreline as service centres. What service do they provide? It took me a while to figure that one out, and I'm not sure it's always the case—there's surface tension to consider—but I think what they do is help the yellow lines shed water (rain). The better they are at this, the more rainwater flows along the cracks and the deeper into the yellow paint the cracks erode.

If you look very closely—mind out for that car!—you often see that the surface of the paint around the cracks is all crozzled. It's old, just like the mudrock on Gabriola's beaches (photograph *below*); shrinkage cracks go in all directions.



If you are a drop of rain landing in the middle of such a crozzled yellow line, it can take you a while to make your way downstream through the maze of cracks to the edge of the line and on to the asphalt. What the cracks do is make life less difficult, because it gives you another option. As a raindrop, you can *either* make your way to the edge of the painted line, *or* you can make your way sideways to one of those cracks. And if all the neighbouring raindrops do it, pretty soon you have a decent sized crack, and irate letters to the editors of newspapers being written. That's service for you.

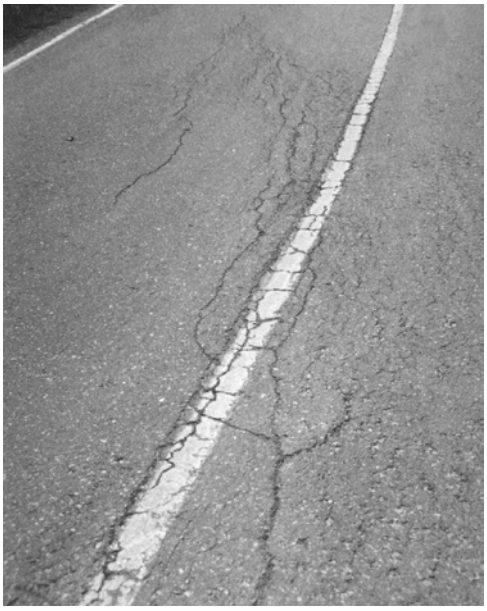
Faults. How about faults? According to the Gabriola Residents and Ratepayers Association there are, or were before the repairs, lots of them. But that's not true. There are only a couple of faults that cross the island and intersect the island's roads.

One of the fault road-crossings is on Taylor Bay Road, just a bit beyond where the ferry lineup ends. That roller-coaster dip in the road. That's a fault. It runs all the way from Descanso Bay to Leboeuf Bay.

The other fault road-crossing is on South Road at the bottom of the hill that goes up to the Community Centre. Look at that picture of cracks in the road surface on the *right*. The cracks are running diagonally across the road in an approximately northeast direction. Who knows why? But consider this. Directly underneath the road, there is that fault. And it runs northeast (N 49º E) all across the island to what used to be the Grande Hotel before it became the Inn at Dragon's Keep at the end of Dragon's Lane.

Now I'm not saying that this strike-slip fault is still seismically active; there's no evidence for that. But maybe, just maybe, the fault *has* altered the bedrock enough to make its presence visible at the surface. No? Well OK, so maybe it is tree roots. Interesting though that events that happened, oh! 40 million years ago now, *might* still be able to engage the attention of islanders.

Who says ancient history isn't important! ◊



Above: Cracks in the road are aligned with the fault that runs across the nearby mudrock beach. Faults in mudrock are difficult to see because they "heal"; only the mismatch in bedding either side of the line gives a clue that this is a strike-slip fault.

Left: Ancient Gabriolan road built by (your choice) the Snunéymux[w], Chinese monks, the Spanish, Sir Francis Drake, or the inhabitants of Atlantis. Shoe size *bottom middle left,* is nine.