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The petroglyphs—discovery and demise

by Nick Doe

It is unlikely that many of the petroglyphs known to exist on Gabriola will be around much longer. Their deterioration is rapid and patently obvious to anyone who has known them for a few years. Research into the reasons for this has been woefully lacking. Neither academics, the Province's Archaeological Branch, First Nations, the Island's collective local government, nor our own Gabriola Museum has managed to move on from expressions of dismay to initiation of goal-oriented, science-based, investigations of what is happening to them.

In a *SHALE* editorial, I once wrote:

"...[An often heard explanation] for the carvings' rapid demise is that they were previously covered with moss, which protected them from the elements. I'm not convinced. There's evidence that moss and lichens erode rather than protect sandstone. Biological corrosion can be mechanical—hyphae and rootlets penetrating between sand particles in the sandstone—and chemical—secretion of acids that attack calcareous rock particularly.

My own observation is that the effect of moss and lichen on weathering surfaces used by the petroglyph carvers is probably neutral overall. ...I don't think exposure to the elements by removal of the moss would drastically increase the erosion rate of such sandstone."

I'm now convinced that in saying what I did, I was completely wrong. Exposure by removal of the moss, lichen, and other organic-rich material covering them is the primary reason why the petroglyphs are rapidly fading. This much is obvious to those who saw them "crisp, deeply incised,

and pristine" when first exposed only a few decades ago.

The brief geological explanation for this is that the upper-Nanaimo Group on which the petroglyphs are carved are cemented by a matrix of very-fine grained micas (*sericite*) and clay and there is abundant evidence that the competency of this sandstone is reduced by sodium chloride ("salt") and several other common salts, particularly those of magnesium. The "text-book" explanation for this is that sodium chloride has a high crystallization pressure, so, whenever salty water evaporates, it leaves behind in the interstices of the sandstone, crystals that exert pressure on the grains of sand, thereby eventually freeing the grains from the matrix. My own experiments suggest that this explanation is probably right though it is hard to prove. Salt is present in our rainwater, particularly in the winter when winds carry aerosols from the sea, and what the salt is doing is re-opening ancient microfractures that have hitherto been filled with a grout of *sericite* and clay.

So what does this mean for the petroglyphs?

Notwithstanding lack of understanding of the details of the de-cementation process, it means that a sandstone surface on Gabriola that is subjected to continual wetting and drying cycles, or forms an on-going evaporation surface by being both supplied with moisture and exposed to the sun—any such surface is vulnerable to de-cementation.

Given this, the following observations support, I think, the idea that a covering of

moss, litter, and organic rich topsoil significantly slows weathering of sandstone.

Any surface not exposed to the sun and wind will dry out more slowly than one that is. We should note here, that the hypothesis is that it is less harmful to the surface to be either continuously wet or continuously dry than it is for it to be continually wetted and dried.

In the *SHALE* editorial, I remarked on the lack of readily observable markings on sandstone surfaces—striations, grooves, and crescentic gouges—that are the result of the passage of ice. I even went on to hint that there may not be any on Gabriola, and that this was evidence of the on-going weathering of sandstone surfaces such as those on which petroglyphs are found. I now know better.

Such markings do exist here, but—and this is a very big but—they do not exist on any surface that has been exposed to the elements for any length of time. All of the sites where I have found the distinctive and unmistakable signs of glaciation are sandstone surfaces that have only recently been uncovered by construction work, road-building, quarrying, or by those mysterious and seemingly purposeless earth-moving operations that owners of earth-moving equipment seem to enjoy doing from time to time.

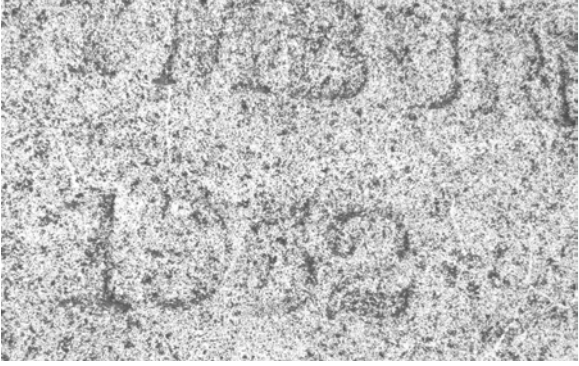
The message is powerful. Sandstone surfaces that remain buried can remain intact for a long time, thousands of years perhaps, but those that are exposed weather rapidly.

It all adds up. Moss good; exposure bad. If this is a “new truth” it is only so by dint of being an “old truth” rediscovered. I

remember Hazel Windecker telling me of how, in the old days on Gabriola, children were only allowed to see the petroglyphs if they carefully replaced the moss covering them after they’d done. I remember too, Vera Wayman entertaining a group of us with her memories of days gone by and telling us the story of her failed attempts at making cement using sand from the beach, failed of course because the sand was salty.

So, what’s to be done about it? Waiting for an unequivocal diagnosis of the problem is probably not a sensible option. The big questions are obviously, can we do anything, and if so, do we want to? I’ll leave those to another forum, but for my part, with my researcher’s hat firmly in place, I just think it would be a crying shame if we let the petroglyphs fade away unrecorded. And by unrecorded, I mean, not completely recorded.

Sure there exists information, best described as “loosely organized”, in the petroglyph reproductions in the Gabriola Museum grounds and the attendant master-rubbings held in their archives; in the geographic information system (GIS) of the Snunéymux^w (along with ethnographic knowledge that is theirs alone); and in the Archaeological Branch in Victoria. But the focus of this information so far collected is skewed to the perspective of those that view petroglyphs as “mysterious art objects” whose true meaning and origin can *never* be known. Recording of information, principally scientific and archaeological information that just might move us along the path toward satisfying our curiosity about these treasures is as a consequence sadly lacking.



Left: All but the most recent gravestones in the Pioneer Cemetery on Gabriola are heavily weathered. This one is typical and is made of concrete, and although only fifty years old (1952), the inscription is on the verge of becoming illegible.

If the petroglyphs are thousands of years old, how come they have not weathered in the same way? One explanation is that the moss that has recently been peeled away once protected them from salt corrosion.

Even worse, is that some of this information is, through ignorance, being destroyed. It is in fact *illegal* to make rubbings of a petroglyph without written permission from the Archaeological Branch; it is *illegal* to remove moss, lichen, and topsoil from them or to go searching for them by doing so; it is *illegal* to “clean them up”—and the simple reason why is that such actions might destroy the basis for any thorough investigation of them. You can’t even think about lichenometric, AMS radiocarbon, or X-ray electron microprobe analysis if all the lichens and weathering coatings have gone. Seemingly harmless rubbings made with muslin and cobbler’s wax are known to have an effect on the ratios of trace-elementations in the grooves that may offer dating information, though to be honest, the chances of this are slim without a thorough understanding of sandstone weathering, which we currently don’t have.

Petroglyph records need to be updated using any of the instruments and techniques now available to us that might help: GPS; laser distance meters; surveyors total stations; computer-aided drawing; laser topography; infrared photography; night photography using artificial light; and photogrammetry at sites where the geometrical inaccuracies of rubbing is apparent and astronomically-significant alignments are possible. The natural elements of sites—concretions,

fractures, drainage channels, glaciation marks (if any)—and their positions, azimuths, inclinations, and petrography need adding to many records.

Features that appear to have no artistic merit, and so may not have been included in drawings and rubbings, need to be checked and included just like any other. Scholars need dated photographs and they need databases that fully capture the relationships between individual petroglyphs on the same panel, panels at the same site, and sites in the same geographical area. Inadequate photographs; drawings that lack scales and orientation; incomplete or badly organized field notes need weeding out and replacing or supplementing.

It sounds formidable and a bit clinical I know. Why not after all just let them be and die a natural death? But then tell me this. If someone were to come to the Island, someone who knew how old they are and how many people carved them and how, and possibly even what some of them may represent, would you go to listen to the story he or she had to tell. I know I would. By doing nothing, we are losing any chance that that will ever happen.

Our generation has discovered the petroglyphs, but to me, it is not right that we should also be the generation that has consumed them. ◇