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ERRATICS IN OKANOGAN COUNTY

By
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Kick at the rock, Sam Johnson, break your bones;
But cloudy, cloudy is the stuff of stones.
*(*From "Epistemology" by Richard Wilbur)

Compared to the numerous terraces, kettles, and roche moutonnees in the glaciated terrain of Okanogan County, erratics are small features, but they are numerous and, no doubt, have caused many to wonder just where these boulders came from.

An erratic is "a rock fragment carried by glacial ice or by floating ice, and deposited when the ice melted at some distance from the outcrop from which the fragment was derived (and range) from pebble to house-size"[1]. The official definition includes everything down to pebble size but I prefer to think of erratics as large rocks. They are other things as well: three of my associates, Don Hruska, John Whitecar and Gary Mundinger, belong to the Wenatchee Chapter of the Ice Age Floods Institute called "The Erratics", a group of people who address issues of the floods associated with ancient Glacial Lake Missoula that created the Channeled Scablands of our state.

Back to the rocks: Erratics can be made of any kind of rock, but in our area they are mostly basalt (from the Columbia River plateau basalt), or gneiss (from the Okanogan Highlands), or granite from the various plutons nearby and in the Cascades. Their mode of origin has been briefly discussed in a previous Heritage article[2] as a consequence of the "plucking" action by the last ice sheet that occupied our area 100,000 to 12,000 years ago. All bedrock is fractured to a greater or lesser degree and at the base of the ice, under thousands of pounds per square inch, the ice can melt and seep into those fractures, refreeze and wedge a rock free for a trip south.

Continental rocks have a density of about 2.8 times that of water. Ice is a bit less dense than water and under high pressures behaves as a fluid (that's why glaciers can move). So the future erratic remains at the base of the ice due to its weight and is tumbled and ground against the basement rocks thereby losing its sharp edges to become rounded - or at least sub-rounded.

A well rounded example is Balance Rock, arguably our most famous erratic (Fig. 1) occurring south of Coyote Creek Road.

Figure 1 – Balance Rock south of Omak Lake supported by the author.

Not far away, at the south end of Omak Lake is an impressive gneissic monster covered with "petrograffiti", for want of a better word (Fig.2).

Figure 2 – Don Hruska and John Whitecar examining a large gneissic erratic at the south end of Omak Lake.

Then, along Columbia River Road near the north end of Omak Lake is an interesting erratic composed mostly of dark *xenoliths* (foreign rocks) in a light granite matrix (Fig. 3). Xenoliths are ghosts of roof pendants that have dropped into a liquid magma as it was intruding upward into the Earth's crust.

Figure 3 – A xenolithiferous erratic along Columbia River Road, near the north end of Omak Lake.

Timentwa Flat, west of Omak Lake, is the northern extent of the bulk of the Columbia River basalt and is littered with "haystack rocks" composed of *entablature*-jointed basalts. Weathering of the hackly entablature usually results in an alluvial apron surrounding the feature as shown in figure 4. *Colonnade*, the other basalt jointing pattern, also contributes some erratics on the Tinentwa Flat.

Figure 4 – Classic basalt entablature erratic ringed by a talus apron on the Bridgeport-Waterville Plateau. This area is best described as a 'erratic-strewn field' with "haystack rocks".

The sub-rounded one shown in figure 5, named here "The Wheel", is curious because it has a hole in the center! In a flight of fancy, I have wondered if the early Native Americans weren't trying to make a wheel out of this erratic and the hole is where the axial would go. More realistically, this hole might possibly have formed by volatiles in the lava trapped at the center when the lava solidified inward to form the rock. The terms "entablature" and "colonnade" are architectural terms alluding to ancient Greek columns topped by complex decorations and these terms have been adapted by geologists to describe the two types of basalt fracturing. When you see basalt erratics, they will be either one or the other.

Figure 5 – John Whitecar and "The Wheel", a basalt colonnade erratic on Timentwa Flat just west of Wakefield-Cameron Lake Road.

A dilemma arises with the occurrences of Columbia River basalt erratics in the areas of: (i) Brewster Flat (The Wick erratic*, Fig. 6), (ii) a few miles up the Methow Valley (Fig. 7), and (iii) here and there in French Valley (Mundinger's erratic**, Fig. 8). It is almost certain that the ice flowed only south from Canada, where most of the North American continental ice sheet originated, and east from the high Cascades, where more ice was forming from the moist westerly's flowing in from the Pacific, forming coalescing alpine glaciers during the Pleistocene epoch. But ice could not flow north or west from areas where no ice was forming. Since the only source for these basalt erratics is from outcrops forming Timentwa Flat – the northern-most extent of the Columbia River basalts - one wonders if the last ice surge eroded into oblivion the outcrops from which these erratics came? If not, then from whence came they? It is a mystery.

Figure 6 – The Wick erratic on the Brewster Flat.

Figure 7 – John Whitecar, Gary Mundinger, and Richard Ries at a basaltic entablature erratic near the mouth of the Methow Valley.

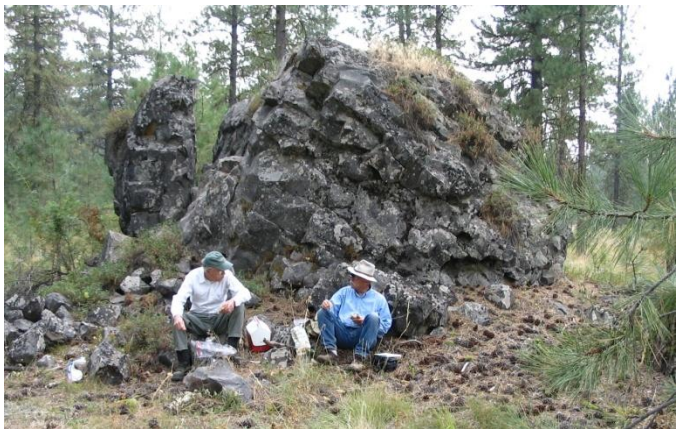


Figure 8 -- Gary Mundinger and John Whitecar have lunch at "Mundinger's erratic", two miles north on Lyman Lake-Moses Meadows Road.

North of Omak, close to the Okanogan River, in a pasture belonging to the Vejraska family, is a remarkable assortment of boulders that show features of water erosion (Figs. 9 and 10). Why these peculiar large rocks occur only here is unknown. They are mainly gneisses but a few are basalts (unrelated petrologically to the Columbia River Basalt group, thank goodness!). These rocks are too big to have been carried here by liquid water. But after being deposited by ice, they were then sculpted by flowing water suggesting that the melt waters at the end of the Pleistocene ice age swelled the Okanogan River considerably and for a long time.

Figure 9 – Erratics in the Vejrarska family pasture along Omak River Road on Sand Flat.

Figure 10 – Don Hruska admiring a Vejraska Erratic showing extreme sculpting by water erosion.

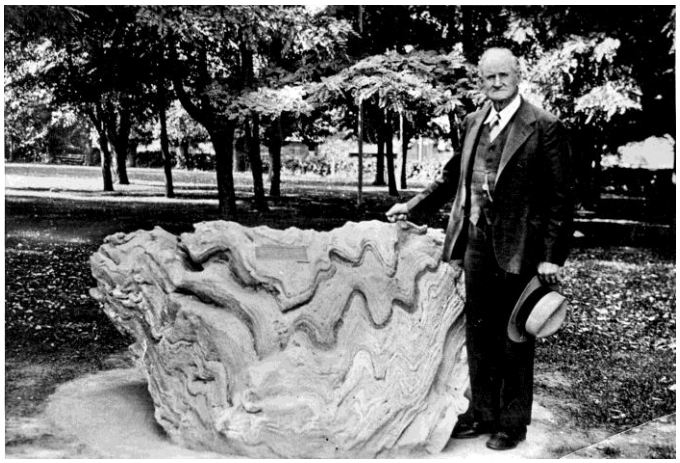
Near the turn of the last century frontier photographer Frank Matsura shot an entablature erratic near Duley Lake about a mile north of LeFleur (Fig. 11). In the background one can see the outcrop from which it may have come. Both entablature and colonnade fracture types are evident there[3].

Figure 11 –Frank Matsura photo near Duley Lake.

The rock ages of all our erratics are 50 million years or more for the granites and gneisses and 14-16 million years for the Columbia River basalts. But as erratics, all were created during the last glacial surge ending about 12,000 years ago. Now exposed to the elements, lichens, plant roots, and the pounding of geological hammers, these erratics are slowly weathering away. Many of them tend to crack in two, possibly from tensional forces acting from their peripheries (Figs. 8, 10, and 12). Those that have been cracked for a while often have a tree or bush growing in them as if they were a natural flower pot (Fig. 10).

Figure 12 – Like some prehistoric rock fish rising from a field, this split gneiss erratic occurs along the Tonasket-Havillah Road.

Sometimes erratics become pet rocks. The Wheel (Fig. 5) appears to have been brought in from someplace else presumably by the land owner and since it appears to have no other function than to sit there and look pretty, it would qualify as a pet rock. The city of Omak's attractive pet rock is a gneiss erratic residing on the northeast corner of Civic League Park. It appears to have been sculpted by water erosion with the softer dark foliations deeply incused between the harder silica-rich lighter foliations in high bas relief. It was brought in from Tunk Valley[4]. Even the Vejraska boulder field (Figs. 9, 10) is an assortment of pet erratics. When our group, The Friends Of the Okanogan Lobe (FOOLs for short) visited this site last year, we were told not to disturb them or take any of them away.



Mr. Ben Ross with the Omak Erratic, also known as Ben Ross Rock, in the City Park, 1935 OCHS #1

No one should ever become bored driving the roads in the Okanogan. Not only is the scenery beautiful but the geology is fascinating. Even if it is just a big old rock sitting out in a field, it has a story to tell.

*Occurring on the former Wick property, now owned by Sid Johnson of Brewster, OCHS member, and who named the erractic.
** Discovered by Gary Mundinger of Omak, also an OCHS member, and who had the rock petrologically analyzed proving that it belonged to the Grand Ronde member of the Columbia River Basalt group that only occurs as in-place outcrops in our area several miles to the south on Timentwa Flat. (Mr. Mundinger avows that his mission in life is to find out where these basaltic erratics came from.)

References

1. Glossary of Geology, American Geological Institute, Wash. DC, 1972, M. Gary, R. McAfee and C. L. Wolf, Eds.
2. Holden, J. C., Roche Moutonnee in Okanogan County, Okanogan County Heritage, fall, 2008, pp. 19-20.
3 Roe, JoAnn, 1981, Frank Matsura: Frontier Photographer, Madrona Publ., Seattle, 144 p.
4. Mr. Gary Mundinger, personnel communication

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