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GO TAKE A WALK

Go Take a Walk is a new series of articles brought to you by the CSPG Fieldtrip Committee to explore easily accessible geology at home and abroad. These articles focus on geological points of interest in cities, historical sites, museums and geological destinations a short walk from the car.

Calgary's Glacial Erratics: at the Confluence of Geology and History

By Astrid Arts & Gabrielle Abernethy

Alberta's glacial erratics have had an enduring influence on our cultural history. Against the backdrop of expansive landscapes, the largest of these stone blocks have wielded a psychic pull on inhabitants and visitors. James Hector, geologist of the Palliser Expedition, first reported on these large blocks of quartzite in 1863:

"...and 50 miles from the Rocky Mountains, there occur a very extraordinary group of blocks of granite....These blocks are of great size, one having been estimated to weigh 250 tons. Although, lying in a line, miles apart, they seem to consist of the same rock, viz., a mixture of quartz and red feldspar..." (Palliser, 1863, p.221)

Hector failed to piece together their source, though it was broadly understood by Hector and his contemporaries the erratics and the 'drift' of gravels upon which they sat were the work of glaciers.

Erratic: glacier-transported rock or boulder that differs from the local bedrock, may be embedded in till or occur on the ground surface.

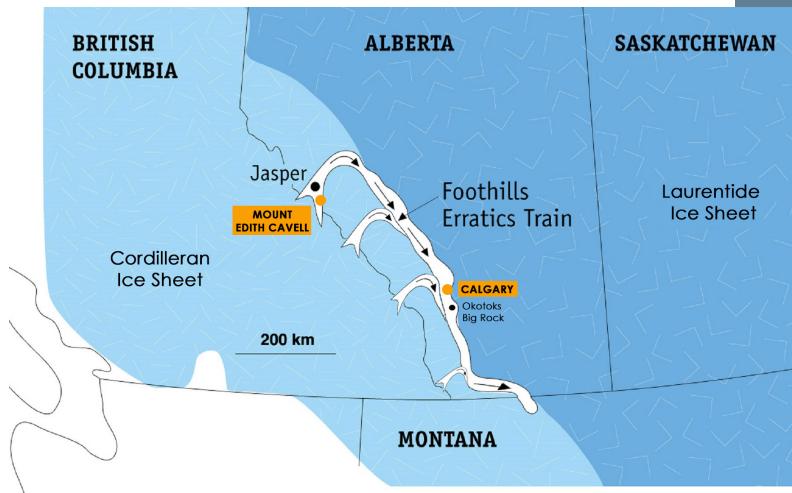
Archie Stalker (1956) mapped out this narrow belt of boulders and worked to solve the mystery of their origin and manner of emplacement. He dubbed them the Foothills Erratic Train. Stalker was not able to identify the origin of the erratics but suggested enough criteria that, Mountjoy (1958) was able to decisively conclude Mount Edith Cavell in Jasper National Park was the source.

The quartzite erratics are composed of fine to coarse grained sandstones and pebble conglomerates. They are massive to cross bedded and have a distinctive light grey to pinkish hue. It was recognized early that the erratics were from the Lower Cambrian Gog Group, 540-512 million years ago. These rocks, derived from the mass wasting of cratonic metamorphic and igneous sources, were deposited in deltaic or shallow marine conditions. The coeval Cambrian Explosion, the evolutionary burst of life that filled the oceans with all major animal phyla, is

LIMESTONE BLOCK
SITTING ON FRESHFIELD
GLACIER, ALBERTA
NA-3551-84

The large size of the erratics and absence of striations indicate the blocks were carried on or near the surface of the transporting glacier, [NA-3551-84] by H. Woolley. Courtesy of Glenbow Archives, Archives and Special Collections, University of Calgary.





captured by the diverse trace fossil assemblage found in this clastic succession. (Magwood, 1988)

During the Wisconsin Glacial Maximum, a rockslide from the cliffs of Mount Edith Cavell tumbled onto the Athabasca glacier and travelled north-eastward down the valley before intersecting the south west advancing Laurentide Ice Sheet. When the two ice sheets collided, they were deflected south as glaciation advanced across the continent. When the glaciers melted, a 600+ km chain of erratics were stranded in their present positions along a corridor from Jasper National park to northern Montana marking the boundary of these two great ice sheets.

The timing of coalescence between the Cordilleran and Laurentide ice sheets would help answer some anthropological questions. Was there an ice-free corridor during the last glacial maximum? Could there have been a pathway for



TRAPEZOIDAL BODIES RESEMBLE HOPI/FREMONT ROCK ART

Photo Credit: Brett Abernethy

ERRATICS TRAIN AEA

The Foothills Erratics Trains marks the junction of the Laurentide and Cordilleran glaciers (modified after AB Gov, 2021, Foothills Erratics Train Map, accessed 4 April 2021, <https://www.alberta.ca/Okotoks-erratic-big-rock.aspx>).



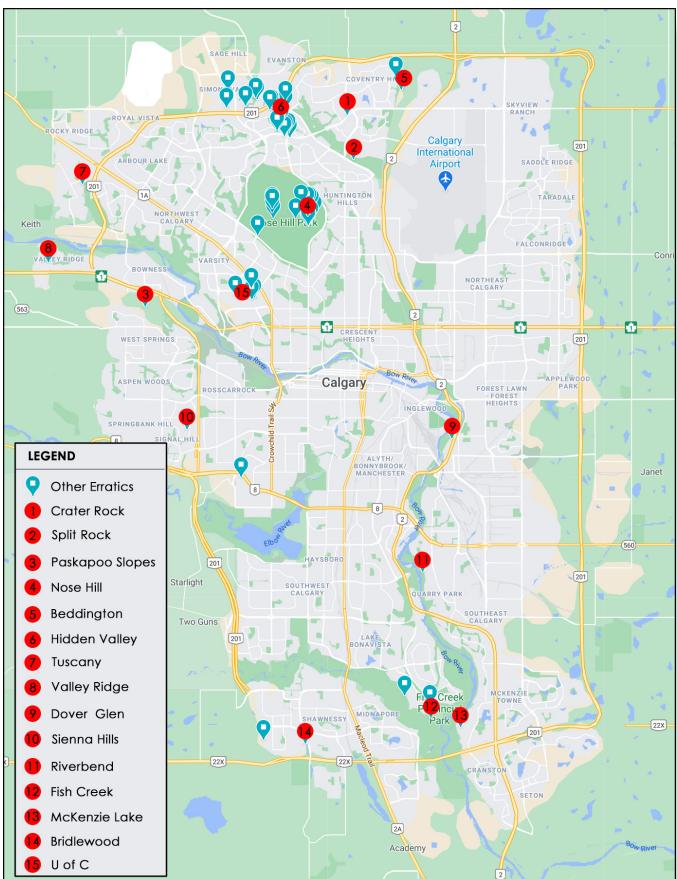
FLUTE PLAYER MOTIF

Photo Credit: Jim Henderson

human migration from Asia, across the Bering Land Bridge, through an ice-free corridor and into the lower latitudes of the continent? Jackson et al. (1997) dated the emplacement of the erratics using cosmogenic ³⁶CL exposure dating. They determined the Foothills Erratic Train was deposited between 11,000 and 18,000 years ago and suggested that coalescence of the Cordilleran and Laurentide ice sheets was the maximum extent of continental glaciation in

western Canada. Geological and anthropological evidence now suggests the ice-free corridor was a transient feature at best and likely not a feasible route for the earliest human migrations. Routes along the west coast of the continent are a more credible alternative for the journey of humans into North America. (Jackson & Wilson, 2004).

The ancestors of the Tsuut'ina, the Stoney Nakoda, the Cree, and the Blackfoot hunted and camped amongst the lush coulees and valleys of our region and exchanged peace and war amongst themselves before the first Europeans came to barter for furs. Some of their stories are older than the forests and the rivers themselves: stories of a northern land engulfed in ice and snow and mystical adventures, immortalized in the constellations, undertaken by the animals to retrieve summer. Those pre-contact Indigenous peoples that looked north to an endless expanse of winter were witnessing the waning of the Last



DISTRIBUTION OF ERRATICS IN THE CITY OF CALGARY

The star stories are old - a testament to the temporal reach of human observers to our glacial past. But, they are not isolated. Hopi stories of the Flute Clan traveling north to a 'land of ice and snow' may have evidence in pictographs found at Grotto Canyon, near Exshaw. A flute player motif and trapezoidal bodies found in the rock art panel of Grotto Canyon resemble southwest Hopi/ Fremont rock art imagery. The flute player motif is directly equated with Kokopelli, a trickster figure in the traditions of the Hopi people and a totem figure for the Hopi Flute Clan. (Magne and Klassen, 2002)

Fast forward to a 'recent' ~11,000 years ago, to the first intrepid humans following Pleistocene horses and camels to the cool climes of Canada. These early nomads came and went; their pulses of advancement left in flakes of stone tools and hunting technology. Their early stories were intertwined with the stars but later peoples shifted their skyward gaze to the landscape and left their memories painted on the rocks. Red ochre, mixed with animal fat, was used to draw images and meaning on canyon walls, on cliff faces, in caves and in the hidden recesses of erratics. The pictographs were indelible reminders of spiritual journeys, their meaning best left to those original inscribers. Erratics, mysterious monuments sitting incongruent amongst the open prairie, were frequent sites of rock art. For many First Nations, rocks are 'grandfathers'; the erratics were not simply impressive rocks but rather an ancient forebear meant to be revered and respected - intuitive location choices for ethereal imagery.

Alberta's largest erratic, the Big Rock, at Okotoks, holds special meaning to the Blackfoot. Blair First Rider (2020), an Aboriginal Cultural Advisor for Alberta Culture and a member of the Blood (Kanai) Tribe, has said of the Big Rock: "The Blackfoot used the site as a place of visitation, ceremony and documentation. Vision quests took place, and red ochre was used to record important events and imagery—a battle scene, a hunting party—on the rock's surface. 'These pictographs are also stories, and that is how we recorded significant events that are connected to this landscape... These are our landmarks and place names; it's our record in stone.'"

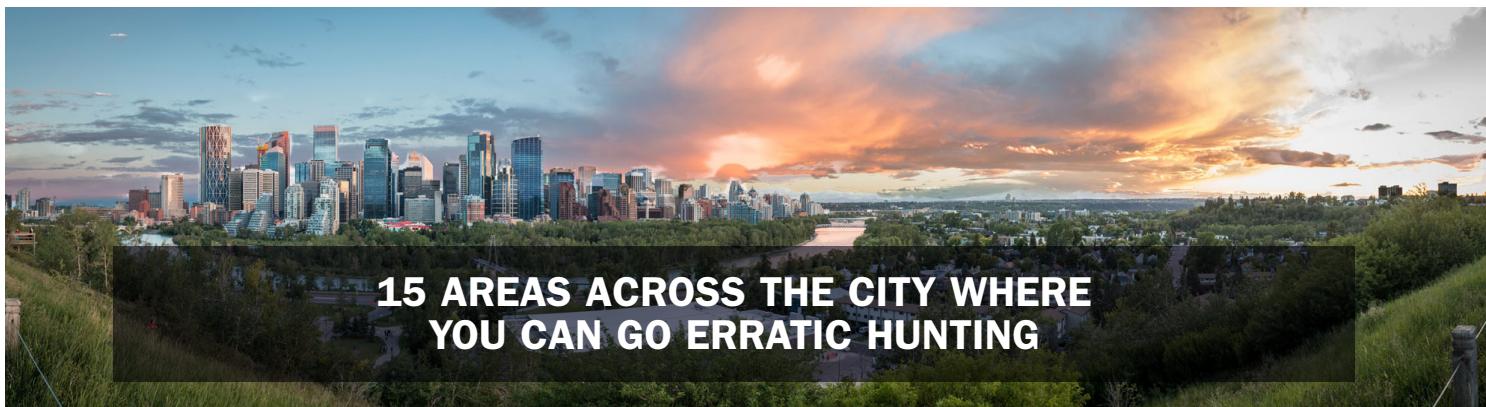
Ice Age, its maximum reached more than 20,000 years ago. The earliest passage of humans along the western coastal route bypassed the inhospitable north to settle first in South America and the southern United States approximately 14,000 years ago. As the ice receded and icy melt waters carved into the dry and cool grasslands, the animals came and the storytellers followed, gradually dispersing north of the 49th parallel. Four hundred generations of storytellers imbued their oral tradition with magic realism, accounting their observations in fantastical events meant to teach and immortalize.

Wilfred Buck, from the Opaskwayak Cree Nation in Manitoba, is an Indigenous star-story expert. A story shared with him by Indigenous Elders, recounts a time of perpetual ice and snow in the North Country; it is the story of the Fisher, Ochek. The Fisher was tasked with retrieving summer, as the little summer birds had been bundled up and imprisoned, keeping it winter all the time. Fisher used his sharp teeth to rip open the bundle and released the summer birds. The man who had captured the birds came running after Fisher with a bow and arrow but Fisher jumped into the sky and climbed right to the stars. Today, the outline of the Fisher's body is commonly recognized as the Big Dipper constellation, his broken tail the Dipper's handle. (Buck, n.d.)

Split Rock, situated at the west end of West Nose Creek (Confluence) Park, near Harvest Hills Boulevard, bears no sign of pictographs, but its smoothed edges bear the mark of bison that once roamed the area and used the erratic as a rubbing stone, helping to shed their winter coats. The Rubbing Stone, aptly named by locals, on the east flank of Nose Hill Park, near the 64th Ave parking lot, also bears the polishing work of bison. The depression circling its base testifies to the centuries of dust loosened and blown away by bison hooves. Though no wild bison roam here now, their bones are found at the base of ancient bison jumps and amongst the fire broken rock of hearths from pre-contact encampments that lie buried among Calgary's plateaus and valleys. Many archaeological finds within Calgary provide evidence of hunting and camping as early as ~8,500 B.P and Clovis points ~11,000 B.P have turned up, the remnants of spear throwing hunters reliant on now extinct Ice Age mega-fauna including mammoth and long-horned bison.(The City of Calgary, 2019)

At the confluence of geology and history, is the city of Calgary. At its centre, the Bow River bends southward where the meltwaters from the retreating Cordilleran

ice sheet dammed along the front of the Laurentide ice sheet. Where the Elbow river empties into the Bow, the Blackfoot Confederacy met and camped. The gathering spot was a natural choice to establish trade and Fort Calgary was built, later to become a population hub along the metal track that tied the new country of Canada together. It is here the erratics still elicit wonder and respect. The Big Rock west of Okotoks is the largest and most famous erratic in the train, but the city of Calgary has a surprising number of large erratics worthy of exploration. Valley Ridge, Sienna Hills, Paskapoo Slopes and West Nose Creek offer interpretive signs. The 500 tonne erratic in Panorama Hills inspired the naming of the Buffalo Rubbing Stone Elementary School when it opened in 2017. And for anyone who has been a student at the University of Calgary in the last 50 years, "The Rocks," limestone erratics covered in thousands of layers of paint, are a communal message board for students to broadcast their opinions and to advertise events. Their importance inspired a YouTube video produced by the University of Calgary Alumni (2016) and can be viewed at: <https://www.youtube.com/watch?v=hkmV1KfK1qQ>



We have compiled a list of 15 areas across the city where you can go erratic hunting. Many of the larger erratics are in their original locations and sit among parks and green spaces. Smaller erratics have been moved around during the construction of new communities and are also commonly incorporated into green spaces. Below are instructions to access the Google Maps list of erratics in Calgary:

- 1. Visit: [google maps link](#)**
- 2. "Star" the map (next to the description) to save it to your google profile**
- 3. To find the Map**

On your Desktop: In the hamburger menu select "Your places" then "MAPS" and you will find "Glacial Erratics in Calgary" in your list

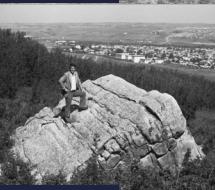
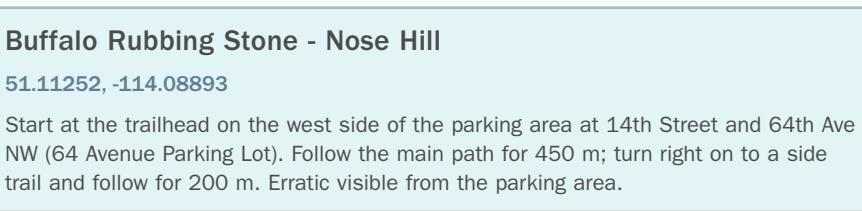
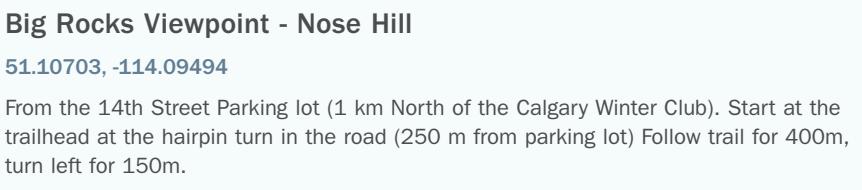
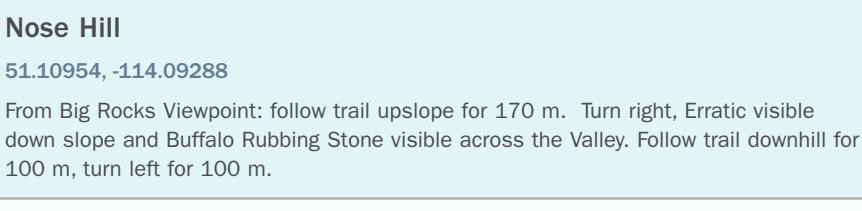
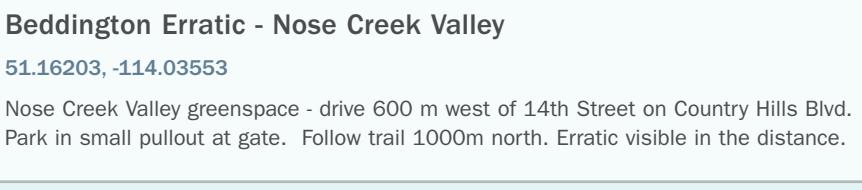
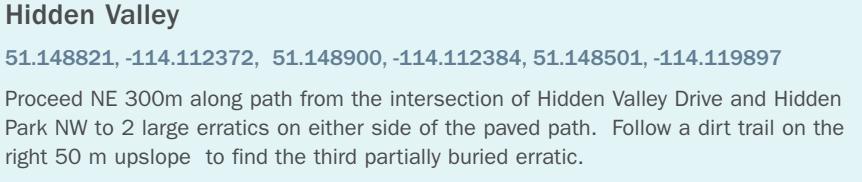
On the Google Maps App on your smartphone: select "Saved", scroll to the bottom and select "Maps" and you will find "Glacial Erratics in Calgary" in your list

Take a selfie with an erratic and tag @CSPGeologists on twitter or @CSPG on LinkedIn with the hashtag #rocktrain. If you find an erratic not on the map, email us. We are at cspgfieldtrips@gmail.com.

Go Take A Walk to explore Calgary's geoheritage and have fun!.

Visit the Erratic Sites Around Calgary

Get out and enjoy these sites today!

	 Crater Rock - Panorama Hills 51.15203, -114.06968 Intersection of Panorama Hills Way and Panorama Hills Road NW HISTORICAL
	 Split Rock - Confluence Park 51.13468, -114.06589 West Nose Creek Confluence Park - drive 200 m north from Beddington Trail on Harvest Hills Blvd; turn right into public parking area and follow trail 500 m east. HISTORICAL
	 Paskapoo's Big Rock - Paskapoo Slopes 51.075067, -114.198675 Follow trail adjacent to 99 Cougar Ridge Heights SW. Follow trails 500m downslope. HISTORICAL
	 Buffalo Rubbing Stone - Nose Hill 51.11252, -114.08893 Start at the trailhead on the west side of the parking area at 14th Street and 64th Ave NW (64 Avenue Parking Lot). Follow the main path for 450 m; turn right on to a side trail and follow for 200 m. Erratic visible from the parking area.
	 Big Rocks Viewpoint - Nose Hill 51.10703, -114.09494 From the 14th Street Parking lot (1 km North of the Calgary Winter Club). Start at the trailhead at the hairpin turn in the road (250 m from parking lot) Follow trail for 400m, turn left for 150m.
	 Nose Hill 51.10954, -114.09288 From Big Rocks Viewpoint: follow trail upslope for 170 m. Turn right, Erratic visible down slope and Buffalo Rubbing Stone visible across the Valley. Follow trail downhill for 100 m, turn left for 100 m.
	 Beddington Erratic - Nose Creek Valley 51.16203, -114.03553 Nose Creek Valley greenspace - drive 600 m west of 14th Street on Country Hills Blvd. Park in small pullout at gate. Follow trail 1000m north. Erratic visible in the distance.
	 Hidden Valley 51.148821, -114.112372, 51.148900, -114.112384, 51.148501, -114.119897 Proceed NE 300m along path from the intersection of Hidden Valley Drive and Hidden Park NW to 2 large erratics on either side of the paved path. Follow a dirt trail on the right 50 m upslope to find the third partially buried erratic.



Tuscany

51.1242061, -114.238700

Follow the pathway adjacent to 8 Tuscany Hills Point NW for 150m



Valley Ridge

51.092761, -114.260458

Follow the pathway adjacent to 64 Valley Creek Crescent NW for 80 m



Dover Glen - Southview Off Leash Area

51.022236, -114.003136

Access from Southview Off Leash area Parking Lot on Gosling Way SE (access to Inglewood Golf Course). Follow trail south 200m. Erratic visible from Deerfoot Trail.



Sienna Hills

51.025962, -114.171901

Playground at junction Sienna Hills Drive and Crescent



Riverbend

50.968840, -114.021928

Follow the pathway adjacent to 178 Riverview Park SE for 100 m



Fish Creek - Bow Valley Ranche

50.910158, -114.016755

Access from the Fish Creek Park -Bow Valley Ranch Parking Lot off Bow Bottom Trail SE. From the NE corner of the parking lot area, follow the pathway 100 m east, turn left and follow the trail 50 m up the slope.



McKenzie Lake - Mt Norquay Playground

50.906422, -113.997734

Playground adjacent to 250 Mountain Park Drive SE



Bridlewood - Bridlewood Wetlands Park

50.899837, -114.096664

Located adjacent to 55 Bridle Creek Park SW at entrance to Bridlewood's Wetlands Park



The Rocks - University of Calgary

51.078585, -114.129250, 51.077993, -114.130682

Located along the main pathway on the south side of MacEwan Hall on the University of Calgary Campus