Dinosaur Tour

*Location, 2nd floor, main gallery*

**A note about the dinosaur bones**: Most of the bones in the museum are plaster casts from actual bones – this is due to the fragility and value of actual bones. Real bones are made of rock and are therefore very heavy – they cannot be mounted in life-like poses the same way a lighter cast can. However, a plaster cast, as an exact replica of a real bone, is as good as originals.

**The *Gorgosaurus*** **(formerly *Albertosaurus*):**
This *Gorgosaurus,*meaning ‘fierce lizard’, was first described in 1914 by Canadian paleontologist Lawrence Lambe. It is a smaller, slightly older cousin of the famous *Tyrannosaurus rex*. This specimen is a juvenile, probably equivalent to a human teenager, and is only two-thirds the adult size. Among the largest land predators ever to walk to planet, this animal had a colossal appetite. Razor-sharp teeth jaggedly arranged along its massive jaws, enormous jaw muscles that protruded from the extra holes you see in its skull and small but powerful forearms combined to enable the*Gorgosaurus*to eat rapidly. Stones called gastroliths were also used to further grind up meat were in the animal’s stomach.

*Gorgosaurus* was very fast, probably moving along much like it is posed here. Look at the length of its tail relative to the rest of its body – contrary to so many years of dinosaur representation, they did not drag their tails along the ground, but rather used them for balance. How do we know this? There have been fossils of dinosaur track-ways discovered that have rows of feet, but no line between them to indicate a dragging tail.

**The** ***Thescelosaurus***

The *Thescelosaurus* specimen on display in the Dawson gallery was collected from southern Saskatchewan in May 2008 by the McGill Vertebrate Paleontology Field School. This small, bipedal dinosaur was a herbivore, belonging to a large group of dinosaurs called the ‘ornithiopods’.*Thescelosaurus*are known only from the latest Cretaceous period of North America, dating back 65 million years to a time just before the extinction of the dinosaurs. This dinosaur would have lived alongside *Tyrannosaurus rex*, *Triceratops*, the duck-billed *Edmontosaurus* and several small species of theropod (bipedal carnivorous dinosaurs) like *Saurornitholestes* and *Dromaeosaurus*.

There are three known species of *Thescelosaurus*:  *Thescelosaurus assiniboiensis, Thescelosaurus neglectus* and *Thescelosaurus garbanii.*This specimen likely belongs to *Thescelosaurus assiniboiensis,*which was newlydescribed in 2012. The fossil comprises of an articulated vertebral column, a large portion of the rib cage, part of a scapula (shoulder blade) and a foot. After it was collected from the field, the specimen was leant to McGill under loan from the Royal Saskatchewan Museum. The long process of preparing the fossil out of its sandstone matrix took four years, but the effort was worth it!

**The *Dromaeosaurus*:**
The *Dromaeosaurus*(‘running lizard’), is a dinosaur species found mainly in Alberta. Despite their relatively small size, they were very successful pack hunters, often taking down prey much larger then themselves.

With their razor-like claws and teeth, and their fearsome speed, a group of these raptors could easily overcome a much larger dinosaur before it had time to react. One large dinosaur would make a handsome meal for a group of much smaller *Dromaeosaurs*. Like the *Gorgosarus*, these dinosaurs also had long tails that they most likely used to maintain balance while pursuing their prey. The*Dromaeosaurus* may have developed a form of society out of the necessity to compete with much larger predators.

**The Archaeopteryx:**
*Archaeopteryx*(‘ancient wing’) is the world’s oldest bird. Only ten fossils of this animal have ever been found, all from a place in Germany called Solenhofen. When the *Archaeopteryx* was first found, the feather impressions were accidental erased because the specimen was thought to be small carnivorous dinosaur. We now know that many small carnivorous dinosaurs also had feathers which were used, not for flight, but for insulation and/or sexual display.

**Why have no dinosaur fossils been found in Quebec?**
While dinosaurs almost certainly roamed around parts of Quebec and Ontario, no fossils have been found in this area. The fossils we find in Montreal today are of the Ordovician era; 200 million years before dinosaurs evolved. Remember the famous ice caps that ravaged our territory a million years ago? The weight of the ice gouged away 450 million years of sedimentary rock, along with any fossils that were preserved within it. Alberta, Saskatchewan and Manitoba have undergone a different set of geological events and therefore the dinosaur-bearing rocks in these provinces are still intact.

**What happened to the dinosaurs?**
At the end of the Late Cretaceous period 65 million year ago, a huge meteorite crashed into the Gulf of Mexico, leaving a crater 100km across. It was likely not the impact itself that killed most of the animals and plants of the time, but the clouds of dust the collision threw up into the air. For as long as a hundred years, these clouds obscured the sunlight, affecting the whole food chain: first, the plants could no longer grow, next the herbivores could no longer eat, and then the carnivores ran out of food. The daily hours of sunlight had become too few for life to continue on its previous course. At this point, it is thought the far more resourceful mammals began to prosper, spread and diversify, leading to the eventual ascent of our own species. If the dinosaurs had never disappeared, it is unlikely that we would have had a chance against them. (information from *Bruno Paul Stenson, M.A.)*

**Outline of Mesozoic Era: 248 to 65 million years ago**
Triassic Period 248-206 MYA – The world was one major landmass called Pangea, it consisted of dry landscapes, gingkoes, ferns and cycads (similar to palms), but no flowering plants. Animals included the first dinosaurs and small early mammals.

Jurassic Period 206-144 MYA – Pangea split into a northern continent (Laurasia) and a southern continent (Gondwana). It was a more humid and cooler climate than before with conifers, cycads, tree ferns and gingkoes, but probably no flowering plants.

Cretaceous Period 114-65 MYA – Continents split further and North America is split by a shallow sea extending from Hudson Bay to the Gulf of Mexico. Western North America connected to eastern Asia and the climates were seasonal. The first flowering plants were becoming more dominant than conifers and cycads. Grasses were not yet present, as this type of plant did not evolved until the Cenozoic age. More species of dinosaurs evolved during the Cretaceous period than during the Triassic and Jurassic periods combined.

**Interesting Dinosaur Facts:**

* **Physiology**: Like mammals, most dinosaurs could walk and breath at the same time. Most other reptiles can’t do this because the muscles that control their limbs are also associated with their breathing.
* **Senses:**Therapods (all carnivorous dinosaurs) had well developed eyes and vision centres in the brain, suggesting they relied on sight to locate prey. Some plant eaters seem to have relied on smell to detect predators.
* **Feeding:**Sauropods (‘long-necked dinosaurs’) used stones in their gizzards to grind down plant matter swallowed whole. Ceratopsians (horned dinosaurs) used grinding teeth. Therapods (all carnivorous dinosaurs) had large heads, blade-like teeth, and an extra joint in the jaw to accommodate large pieces of food.
* **Sexual Dimorphism:** Paleontologists speculate that *Tyranosaurus rex* males were grassile, while the females were heavier. Some hadrosaurs (‘duck-billed dinosaurs’) males may have had long head crests, while females had shorter ones. In Protoceratops ( a small horned dinosaur), the males had large frills while the females appear to have had smaller ones.
* **Speed:**Short femur (thigh bone) and long tibia (shin bone) are indicators of a fast runner. Small therapods had disproportionately long legs built for speed and could reach speeds up to 25 kph. Because of their large size, larger therapods we slower, reaching speeds of about 15 kph. Sauropods were slow and were incapable of running.
* **Social Groupings:**Large therapods (carnivorous dinosaurs)may have been solitary or moved in pairs, although there is also evidence that they may have hunted in packs. Small therapods moved in groups of tens of individuals. Sauropods moved in groups of a dozen. Ceratopsians moved in herds of hundreds or thousands.