

**Research at the ROM: Dinosaurs in Alberta's Badlands**  
**Dr. David Evans, Associate Curator of Vertebrate Palaeontology**  
**Royal Ontario Museum**

*[Animated ROM logo with sound sting. Music begins]*

*[David Evans sitting on the ground in a rock quarry]* My name is David Evans. I am a palaeontologist at the Royal Ontario Museum. *[Vertical pan of sky to show the landscape of the Badlands]* Well I'm in the Badlands of southern Alberta. *[Landscape fades to a graphic map depicting North America. Camera zooms into a green dot in Alberta labeled as Milk River Vallery, Alberta]* I'm just on the north bank of the Milk River and *[Shot of David sitting in quarry]* I'm actually sitting in a dinosaur quarry and the dinosaur we took out from here was a large duck-billed dinosaur.

*[Music plays with an image of David driving from the passenger seat. Camera pans to show the dirt road David is travelling on and the pick-up truck he is following. The camera bounces with the rough terrain. Music stops.]*

*[David is sitting on rock terrain speaking to the camera]* There are a number of misconceptions about how Palaeontology out there and one of the big ones is how Palaeontologist go about finding dinosaurs. *[Long shot of two people walking across the top of a hill with sparse, grassy vegetation.]* So when a Palaeontologist goes out in the field to find a dinosaur, he actually spends most of his time walking. *[Cuts to a mid shot of a person walking past the camera on a trail.]* And uh a palaeontologist will walk for many, many hours *[Cut to a close shot of the dry and barren gound.]* before finding suitable specimens. *[Cut to a close shot of a person digging with the claws of a hammer]* This is what we call prospecting and *[a bone is revealed and the person picks it up with bare hands]* it's taken from the *[Cut to medium shot of David sitting on rock terrain speaking to camera]* goldminers term, but in this case fossils are kind of our gold and that's what we are after.

*[Cut to a shot from high on a hillside down toward people walking in the grass]* We don't look for complete skeleton's lying on the ground. *[Cut to medium shot of David sitting on a rock terrain speaking to camera]* We look for bone fragments weathering out of a hillside.

[Cut to close shot of rocky ground that shows fossils emerging from the soil.] If this animal is lying on its side, [Cut to overhead shot of David crouching above fossils facing away from camera] like these specimens here in the ground say, all the legs and everything would be out that way. [Cut to low shot of a group of people looking over a cliff] Out that way is over the edge of a cliff, [Camera pans to show the layer of rock exposed on the cliffs edge] so what that suggests to us is that most of this specimen was lost to erosion, [Cut to shot of David crouched on ground] but you never know until you dig in.

[Music begins again. The camera pans a still shot of brightly coloured tents pitched in the foreground on a grassy field. Music stops.]

[Cut to full shot of David sitting on rocks with men working in the background] What we have here behind me is a bone bed that is dominated by the remains of [Cut to a panning close shot of a fossil] juvenile duck-billed dinosaurs. [Cut to full shot of David crouched in the quarry with a man working in the background.] Excavating a bone bed like this requires a number of steps. The first thing we do after we find the bones eroding out of a specific layer in the hillside, [cut to a shot of a group of men sitting on rocky ground with bones being excavated from the soil] we remove what is called the over-burden [cut to a close shot of a man removing rock from a fossil that is partially exposed.] and overburden is simply the unfossiliferous rock that overlies [cut to a close shot of a hand brushing dust off a fossil with a soft paint brush] or covers-up [cut to a close shot of a person sweeping rock fragments into a dustpan with a soft paint brush.] the fossil bearing layer or bone bed layer in this case. [Cut to full shot of David crouched and speaking to the camera with a man working in the background.] Once the overburden is removed and we've opened up a large quarry area, [Cut to a group of people carrying a frame with a grid tied in string. The frame is placed on the ground.] we then lay a grid over the site and [Cut to a close shot through the grid to the fossils that are exposed from the ground. A plumb-bob hangs between the strings.] that grid allows us to map the bones as we expose them. [Cut to a wider shot of the grid with a plumb-bob hanging] One of the biggest differences between palaeontology today and [cut to a low shot of the plumb-bob hanging just above a partially exposed fossil] palaeontology even 50 to 100 years ago is the [cut to a medium shot showing workers gathered around the grid taking notes] care we take studying the bones while they are still in the ground. [Cut to a shot at a further distance of the workers gathered around the grid.] So mapping is a very important part of this process and it allows us to take the bones in the museum [Cut to a close shot of a clipboard with a paper showing shapes marked in a grid] and put them back into their [Cut to a full shot of David speaking to the camera,

crouching in the quarry with a man working in the background.] geological and special context.

*[Music starts again. Cut to a close shot of a man laying on the ground taking a close look at the rock. A clipboard is visible in the foreground with a person taking notes.]*

*[Cut to a medium shot of a man speaking to camera. A title appears at the bottom of the screen reading Dr. Michael Ryan. Curator and Head of Vertebrate Paleontology. Cleveland Museum of Natural History.]* Whenever we dig up a fossil from the ground we have to be certain that we've completely excavated the rock *[Cut to a close shot of a hand holding a paint brush that is dusting a partially exposed fossil from a rockbed]* from around the fossilized bone. *[Cut to another close shot of a hand holding a paint brush that is dusting a partially exposed fossil from a rockbed]* Then to protect the bone from the next process of putting plaster on it, *[The person stops dusting the fossil and begins placing paper towel on the surface of the fossil]* we put paper towel or toilet paper over all the exposed surface of the bone. *[Cut to close shot of people mixing a white liquid substance in a plastic tub]* We then mix-up Plaster-of-Paris and then *[cut to workers dipping strips of brown fabric into the white liquid]* we dip our water soaked strips of burlap into the Plaster-of-Paris and *[cut to close shot of hands coating the fabric with white liquid that is partially solidified]* when it's hard enough, we *[cut to a close shot of hands cover a fossil with burlap that is covered with white plaster and carefully forming it to the fossil surface]* pull out the slurry of plaster soaked burlap strips and we criss-cross the surface of the bone, then we wrap around the sides of the base of the pedestal. When the field jacket, as we call it, *[cut to a close shot of a fossil covered with Plaster-of-Paris and a person using a chisel and hammer to break the stone pedestal below]* is hardened we will actually undercut with our chisels and hammers the pedestal, *[cut to a person lifting a plaster covered fossil and exposing the underside]* flip that block over, *[cut to a close shot of a person holding a pointy tool and removing rock from the bottom of a plaster covered rock]* remove the excess rock from the bottom, and *[cut to a close shot of a person laying a final piece of plaster covered burlap on fossil]* then we will completely cap that over with *[cut to a shot of Michael speaking to camera with blue sky in background]* more burlap.

*[Music begins again. Camera follows Dr David Evans as he climbs a grassy incline carrying a fossil wrapped in Plaster-of-Paris]*

*[Cut to a medium shot of David Evans standing in a quarry in front of a rock wall speaking to the camera.]* Here we are in the bottom of the Milk River Valley and

we are at the site of a quarry of a *[cut to a still image of a hadrosaur skeleton mounted at the ROM in Samuel Hall Currelly Gallery]* Hadrosaur skeleton. *[Cut back to medium shot of David in the quarry]* The skeleton was relatively together – a lot of the bones were very close together so *[cut to a shot of a group of people struggling to move a large plaster covered fossil]* we had to make quite large jackets were left with a problem. How do we get these really heavy blocks from the bottom of the Milk River Valley to the top of the valley on the other side – well over three kilometers away with a river-crossing in between? *[Cut back to medium shot of David in the quarry]* And the way we solved this problem *[Cut to shot of a helicopter hovering above a grassy dry landscape]* was by the use of a helicopter. *[Cut to another view of the helicopter hovering above the quarry with workers below connecting the large fossil to a rope attached to the aircraft.]* Today we just finished a successful helicopter pull and we now have the jacket of the Hadrosaur in the back of a truck on prairie level. So we're hoping we get *[cut to another shot of the helicopter carrying the large fossil from a rope that dangles near the ground over the quarry]* these blocks that we just air-lifted out of here today, back to the lab to clean them off and compare them to other hadrosaurs *[cut to another shot of the helicopter carrying the fossil rock at a higher altitude]* and we suspect that they might be different and those differences might warrant a brand new species of dinosaur being named. *[Cut back to medium shot of David in the quarry]* So we have to go and join the crew and celebrate the finishing of this very nice specimen.

<Fade to white. ROM logo appears with a link to the ROM's blog at [blog.rom.on.ca](http://blog.rom.on.ca)>