Dinosaur Provincial Park, One of the Greatest Outdoor Laboratories for Understanding Late Cretaceous Ecosystems

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Dinosaur Provincial Park (Alberta, Canada) is arguably one of the best, if not the best, Late Cretaceous terrestrial ecosystems known. The Campanian rocks of the Park are part of an almost continuous succession of rocks along the Red Deer River, covering the last ten million years of the history of non-avian dinosaurs. Three formations (two terrestrial and one marine) are recognized in Dinosaur Provincial Park, and each has its own distinctive fauna. The majority of dinosaurs are recovered from the sandstones, siltstones and mudstones of the Dinosaur Park Formation, which is up to sixty metres in thickness. Radiometric dates indicate that the formation was deposited from 76.5 to 74.8 million years.

In 1889, T.C. Weston of the Geological Survey of Canada discovered the first professionally recorded fossils in what is now the Park. He reported the presence of vast quantities of bones, but had no time to make any significant collections. On the basis of his reports, Lawrence M. Lambe of the same organization led his first expedition to the region eight years later. Numerous specimens were recovered over three field seasons, and led soon after to the description of the first dinosaur species from Canada. By 1912, field parties led by Barnum Brown of the American Museum of Natural History (New York) had moved into the region, recognizing the richness of the area. However, Brown was soon competing with the Sternberg family and other collectors, who recovered hundreds of dinosaur skeletons that eventually found homes in more than 25 public institutions around the world. This intense phase of dinosaur collecting wound down after the beginning of the First World War and the Great Depression.

Interest was renewed in the late 1960s, when relatively small field parties from the National Museum of Canada, the Provincial Museum of Alberta, the Royal Ontario Museum, and the University of Alberta collected specimens within the boundaries of Dinosaur Provincial Park (created in 1955). The significant scientific discoveries contributed to the momentum of an international renaissance of interest in dinosaurs. In 1979, the Park's rich palaeontological resources were recognized when it became the first palaeontological site on the prestigious UNESCO World Heritage List. Collection and research, mostly by staff of the Royal Tyrrell Museum of Palaeontology (Drumheller) and the University of Alberta (Edmonton), have continued unabated since then, with remarkable new discoveries being made virtually every field season.

More than forty species of dinosaurs are currently recognized from the Dinosaur Park Formation, and another half dozen have been recovered from the earlier but more poorly known Oldman Formation in the lower sections of the Park. The only other non-avian dinosaur site that comes close in dinosaur diversity is the roughly coeval Nemegt Formation of Mongolia. However, the Park is not known simply for its dinosaur skeletons. Hundreds of bonebeds have been documented within the Park boundaries, and each has hundreds to thousands of disarticulated bones that can be identified for a better understanding of the faunal composition. Densities of twenty to thirty bones per

square metre are not unusual, and single bonebeds can extend for more than a kilometre.

In addition to the rich dinosaur fauna, Dinosaur Provincial Park also preserves evidence of more than 75 species of non-dinosaurian vertebrate fossils (including fish, frogs, salamanders, turtles, lizards, crocodiles, pterosaurs, birds and mammals) and over 500 species of plants (mostly palynomorphs, but also leaves and logs).

Without a doubt, Dinosaur Provincial Park has some of the richest Upper Cretaceous resources for studying dinosaur-dominated ecosystems. Multidisciplinary teams of palaeontologists and geologists continue to tease information out of those resources, and each new study gives us a better understanding of why dinosaurs dominated terrestrial ecosystems for 150 million years.