Royal Tyrrell Museum

2010/11 Behind the Science

THE PEOPLE BEHIND THE SCIENCE

It's the insatiable curiosity of the scientists at the Royal Tyrrell Museum that drives our research program. Their discoveries provide the building blocks for everything we do, from educational programming to exhibit development.

The work they do enhances our collective understanding of the evolution of life on Earth.

Andrew Neuman, Executive Director

As Executive Director, Andrew (Andy) Neuman brings more than 20 years of leadership experience to the Museum. An accomplished researcher and educator, Andy's vision and expertise have driven notable international exhibit partnerships and research expeditions. The majority of Andy's research focuses on Mesozoic fishes from Western Canada. He is currently working on Triassic sharks with a team in Europe and on Cretaceous fishes with a team here in Alberta.

Don Brinkman, Ph.D., Director of Preservation & Research

Don Brinkman studies how ancient animals, and turtles in particular, lived in their environments during the time of the dinosaurs. By comparing turtle specimens from Asia and North America, he investigates why some species lived where they did, what unique traits helped them to survive, and how environmental conditions affected them. This research allows Don to determine the conditions of life during specific periods of history, and why some species survived catastrophic events, while others did not.

Dennis Braman, Ph.D., Research Scientist, Palynology

Dennis Braman specializes in palynology—the study of organic-walled microfossils such as plant spores and pollen, algae, or fungal spores. In the field, rock samples are collected from shales, mudstones, siltstones, and coals to be processed in the lab. After dissolving the mineral material with acids, the resulting organic residue is concentrated and mounted on glass slides. The slides are then scanned, using a microscope, so that fossils can be identified. Any 10 to 20 gram sample may contain several thousands of specimens, so these are the most abundant fossils exposed in the rocks on the prairies of Western Canada.

Donald Henderson, Ph.D., Curator of Dinosaurs

Donald (Don) Henderson's research focus is all about dinosaurs. Lately, his studies have focused on the description of a *Chirostenotes* specimen, a cooperative study on gastroliths from a Permian reptile, and body mass estimates for *Archaeopteryx*. Don also conducts many fieldwork expeditions and plans to work with ceratopsian trackways, a hadrosaur bonebed from Dinosaur Provincial Park, and a turtle and plesiosaur from southern Alberta in the near future.

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David A. Eberth, Ph.D., Senior Research Scientist, Sedimentary Geology and Palaeoecology Research

Dave Eberth studies ancient environments of fossil-bearing rocks around the world. His studies take him to China, Mongolia, the USA, Mexico, Argentina, Germany, and of course, Canada. His specialties include sedimentology (ancient environments), stratigraphy (the age and arrangement of rocks), and taphonomy (influences on preservation and fossilization). Dave also has a deep interest in bonebeds—large accumulations of vertebrate fossils—and what they reveal about palaeobiology and ancient ecosystems. His research not only sheds light on what the Earth's ancient environments were like, but more importantly, how they have changed through time and what the future may hold for us. Dave gives numerous public lectures on a variety of research topics including: evolution and science, Alberta's dinosaurs, and the remarkable fossil beds of Alberta, Mongolia, and China.

James Gardner, Ph.D., Curator of Palaeoherpetology

James (Jim) Gardner, focuses on palaeoherpetology, the study of fossil amphibians (such as frogs and salamanders) and reptiles (like snakes, lizards, and turtles). The primary goal of his research is to document and interpret the evolutionary history of Mesozoic and Tertiary members of the Lissamphibia, or so-called modern amphibians. Jim's research focuses on the morphology, systematics, distribution (both geographically and temporally), and palaeobiology of lissamphibian taxa, especially those with North American representatives. Because fossil and living lissamphibians have a near global distribution, his research includes regional and international components.

Michael Newbrey Ph.D., (Betsy Nicholls Postdoctoral Fellow) Palaeoicthyology

Michael Newbrey specializes in the field of palaeoicthyology, the study of fossil fishes. His general research interests include freshwater teleost systematics, biogeography, and ecology for both extant and extinct fishes. He is particularly interested in the effects of climate change on fish populations and evolution. The geologic record contains many instances of major climate change, and as such, the fishes deposited before, during, and after climate change offer insight into the effects of climate change on fishes.

Craig Scott, Ph.D., Curator of Fossil Mammals

Craig Scott specializes in research on Palaeocene age mammals (65 to 55 million years ago) from both the Red Deer and Calgary areas, particularly the evolutionary relationships of early insectivorian mammals (a group that today includes hedgehogs, shrews, and moles). He hopes to integrate his data into an expanded research program that will include an ongoing study of mammal succession in Alberta, before and immediately after, the extinction of dinosaurs.

THE PEOPLE BEHIND THE SCIENCE

François Therrien, Ph.D., Curator of Dinosaur Palaeoecology

François Therrien studies the palaeoecology of extinct animals, which, in essence, is trying to determine what the animals did while they were alive and what the world they lived in looked like. To do so, François uses two different approaches: 1) he studies the shape of the bones of animals in order to determine the behaviours of extinct animals (e.g., how they hunted, walked, laid their eggs) and 2) he studies the features and chemical composition of ancient soils (called paleosols) to reconstruct the environments and climatic conditions the animals lived in. François tries to see past the bones and rocks in order to explore dinosaurs as a single component within a complex ecosystem.

Takuya Konishi, Ph.D., Postdoctoral Fellow

Takuya Konishi specializes in the study of mosasaurs, a group of giant, predacious, and paddle-bearing lizards that inhabited the world's oceans during the Late Cretaceous (about 93 to 65 million years ago). So far, his research has focused on the systematics—a study of classification and evolutionary relationships—of a group of medium-sized mosasaurs called plioplatecarpines, found mostly in the western part of North America. During the Late Cretaceous, a north-south trending stretch of sea, the Western Interior Seaway, covered the area and nurtured a high diversity of marine organisms. Based on the comprehensive systematic work he has conducted on these mosasaurs, Takuya envisages further investigating such aspects of plioplatecarpine mosasaurs as palaeobiology, palaeobiogeography, and palaeobiostratigraphy. In particular, he hopes that he can link some key evolutionary changes that occurred in plioplatecarpines to a wider geographic range that they exhibited towards the end of their evolutionary history. With more than 60 different mosasaur species known today, he also hopes to address these scientific inquiries in other groups of mosasaurs, to answer an ultimate question—"what were mosasaurs?"