Them Bones
By Marshall Honorof

Out in the badlands of Wyoming, not much can survive. This is not a problem when you're looking for things that are already dead. Every summer, Dr. Kenneth Rose from the Johns Hopkins Center for Functional Anatomy and Evolution braves scorching temperatures, dry climate, and painstaking work for one reason: to find fossils. "Nothing is more exciting than to see a gleaming jaw or skeleton lying on an outcrop," says Dr. Rose, fondly recalling one of his many finds in the inhospitable terrain. Bighorn Basin, Wyoming is one of the best places in the United States to find fossils, with many easily-distinguishable layers of rock.

Sifting through rocks in order to find bones in the blazing heat may not sound like everyone's idea of a good time, but Dr. Rose lives for hunts like these. "I got interested when I was eight years old by finding fossils, more or less in the backyard," he explains. Growing up in southern New York during a period when a lot of unused land was being developed for apartments and office buildings, a young Ken Rose was surprised to find that many of the rocks being unearthed were not native to the area. They were remnants of a glacier that had passed over upstate New York thousands of years ago, and they contained fossils of brachiopods and trilobites, ancient invertebrate life forms that existed long before dinosaurs. "Once I saw that stuff, I was absolutely hooked," Dr. Rose recalls. "There was nothing else in life for me but to be a paleontologist."

After finding a vertebrate fossil in Florida, Dr. Rose's research really grew a backbone. "By 8th grade, I was hooked on vertebrate paleontology," says Dr. Rose. "I attended a public school – not a very good one, but I was able to get into Yale somehow," he chuckles. "I was the valedictorian, but in my school, that didn't mean very much."

By this time, Dr. Rose had amassed a fairly impressive fossil collection "I was an introvert," he continues, "and I had a museum in my basement. Instead of sports, I was interested in natural history. A friend and I used to have public displays once a year once I was in junior high and through high school. We got in the newspapers for having this museum."

Dr. Rose's homespun museum did not go unnoticed. While at an admission interview for Yale, he brought a bag of fossils to show to a curator at the university's natural history museum. This bag did not escape the notice of the dean who was interviewing him. "The rest of the interview centered on the fossils. It's pretty clear that I impressed him with that," Dr. Rose remembers.

During his freshman year in college, Dr. Rose first went to the badlands of Wyoming to search for mammal fossils, and the specialization stuck. He continued his studies with a Masters degree from Harvard, a Ph.D. in Vertebrate Paleontology from the University of Michigan, and postdoctoral work at the Smithsonian in Washington D.C. before finding work as a professor of anatomy and paleontology at the Johns Hopkins Medical Institute.

Short and mostly bald with a perfect posture, smart glasses, and a dignified beard, Dr. Rose looks every bit the part of an East Coast university professor. In Spring 2006, he taught an undergrad Mammalian Evolution course at the Johns Hopkins Homewood campus. He spoke in a quiet, clear voice about how he was going to attempt to go through the entire history of mammals, from our first mammal-like reptilian ancestors up into the modern orders. The class was a series of lectures and PowerPoint presentations: there was no hands-on research and little group discussion, and yet the class was filled

over the brim on the first day and remained so until the end of the year. When Dr. Rose spoke, the class was rapt, and at the end of class, everyone stayed to look at the large collection of fossils he would invariably bring: everything from woolly mammoth teeth to rabbit skeletons to primitive horse thigh bones.

Even as a professor of both graduate and undergraduate classes in two separate topics, Dr. Rose's research continues. In Wyoming, Dr. Rose studies the evolution of mammals around the Paleocene-Eocene boundary, a time between two major geological epochs that occurred about 55 million years ago. "We can study patterns of evolution from the fossil record," he points out. Thinking back to the rich fossil deposits in the badlands, he adds: "[Bighorn Basin] is the best area in the world to do that."

The early Eocene was an exciting time for the then-humble mammalian class: "This was the time period during which the modern orders [of mammals] are first appearing and diversifying," says Dr. Rose. "Primates, perissodactyls, artiodactyls," – two large branches of hoofed mammals – "and carnivores started showing up on the Northern continents almost instantly."

Even more intriguing is the idea that this mass immigration was brought about by climate change. Over a period of about 100,000 years – the blink of an eye on a geologic scale – the Earth's temperature rose an average of 5°C. "We're studying how an event like global warming can affect faunas through time, so this has relevance to modern faunas in the context of the current global warming episode," Dr. Rose explains. If global warming brought about significant changes for mammals in the past, there is no reason to think it won't do so again.

In addition to a new project studying mammalian evolution in India, Dr. Rose plans to continue his studies in Wyoming for the foreseeable future. “In 30 years out there, we’ve more than scratched the surface, but there are still places we haven’t been to, and we find something important every year.”

Even though the study of fossils seems unreasonably arcane to some, Dr. Rose disagrees. “Learning something about our place in nature and how humans fit into the broad scheme of the world we live in is very important to keep us in proper perspective,” he argues. “If they knew how exciting and interesting it was, there would be more people interested in the field.” Perhaps most people don’t know how fascinating the field of paleontology can be, but with scientists like Dr. Rose at the forefront, it’s only a matter of time until we can piece together our past, discover how it affects our present, and use it to enhance our future.