

American Museum Of Natural History

Scientific Expeditions 2008

Hi, I'm Michael Novacek, Provost of Science and Curator of Paleontology at The American Museum of Natural History. I'm here to tell you a bit about the many expeditions carried out by my colleagues and me in the recent months. The Museum is not only a home to our exhibitions and collections of over 32 million specimens and artifacts, it's the base camp for some 125 expeditions a year.

With the help of Google Earth, we'll fly to several destinations and visit a few of these expeditions. First, let's land in New York at the Museum itself. Our role as explorers has a 100-year tradition. This map highlights just 36 of the thousands of expeditions that the Museum has supported through the years. Even today, the Museum sponsors far-flung expeditions in every ocean and on every continent, including Antarctica.

Now let's leave New York and hop the Atlantic for our first visit along the Lower Congo River in Western Africa. Here Melanie Stiassny, Curator of Ichthyology, has been exploring the river for its amazing, but poorly known, fish fauna.

At 700 feet, the Lower Congo is the deepest river in the world. Huge columns of water plunge violently, hundreds of feet straight down into the depths and then straight back up again. Many species of fish, some new to science, live in these high-energy habitats. The immense power of the Congo can be appreciated in the video. Note for scale the six-foot man at the river's edge.

Congo fishes like the elephant fish that Melanie is holding can take on unusual form and adaptations. She and her team are studying the genetics, geography, and relationships of diverse species that live in very confined spots within the river.

Leaving the Congo, we fly to South Africa, where Toby Schuh, Curator of Invertebrate Zoology, continues his worldwide survey of plant bug species. Toby is the leader of an international team funded by the National Science Foundation to take a global scale inventory of this hugely diverse group of insects.

He is seen here beating insects from plants and ensnaring them in a specialized insect net. Toby and his colleagues also record the species of plants upon which the insects were collected. Because most species of plant bugs feed only on one species of plant, this provides valuable information about the diversity and interactions within an ecosystem.

Next stop, central Asia and the Gobi Desert -- dinosaur country. But this summer, Paleontology Curator Mark Norell and I led our team to a new area, a huge basin of rock layers that preserve extinct creatures that are even older than dinosaurs. Over time these rock layers have been tilted up almost vertically in spectacular formations hundreds of feet high.

Within the sediments are ancient land vertebrates like *Lystrosaurus*, also known as a dicynodont. These squat, plant-eating animals survived the great Permian extinction event of 250 million years ago, but were edged out some tens of millions of years later in the Triassic when dinosaurs began to diversify.

2008 marked the 19th summer season for our expeditions to the Gobi. The current project is in close collaboration with scientists from the Mongolian Academy of Sciences. In addition to important finds of dinosaur eggs and embryos and the skeletons of dinosaurs, birds, lizards, and ancient mammals, we've trained a couple of generations of young scientists.

We now travel from Mongolia, the world's most landlocked country, to the center of the vast Pacific Ocean and the tiny coral atoll of Palmyra. Here Eleanor Sterling, Director of the Museum's Center for Biodiversity and Conservation, worked with her team to catch, and subsequently release unharmed, dozens of sea turtles.

These were the first such turtles ever caught and documented from Palmyra, providing the first data on the abundance, distribution, movements, health, genetics, and feeding behavior of the local turtle population.

Flying onward over the eastern Pacific, we make for the Oaxaca Valley in Mexico, a region attracting two very different kinds of Museum expeditions. The first of these, led by Anthropology Curator Charles Spencer and Research Associate Elsa Redmond, involves the excavation and description of two Zapotec temples dating to 300 to 100 B.C. The Zapotecs were a thriving urban civilization noted for its art, sophisticated writing, calendar, and of course monumental buildings including palaces, temples, ball courts, and tombs.

Sometimes we dig holes, other times we climb down into them. Also this summer in Oaxaca, students and collaborators descended into the deep caves in search of rare species like this blind cave scorpion. These young explorers worked as part of an international project led by Invertebrate Zoology Curator Lorenzo Prendini, to discover and study diverse arachnids, including scorpions, solpugids, and whip spiders.

Now let's travel back north to the western U.S. and land at a place where our scientists are carrying out virtual expeditions to the Museum's most remote destinations.

At Palomar Observatory in southern California, Astrophysics Curator Ben Oppenheimer successfully deployed an astronomical instrument called a coronagraph and aimed it at distant stars suspected of having planets orbiting around them. The coronagraph, shown here next to the *T. rex* skeleton in our Dinosaur Hall, is built to minute precision in order to black out the light of the star and thus detect nearby objects. By doing this, Ben and his team hope to directly photograph a planet from a solar system outside our own.

We travel now from Palomar in southern California to lonely mountains of Nevada for our last field stop. Here, on Mount Jefferson in the Toiyama Range, Anthropology Curator David Hurst Thomas led a team of a dozen archaeologists and ten horses to an American Indian site called the Alta Toiyama, perched at an elevation of 12,000 feet. This is the highest American Indian village ever found. This past summer, David and his team used GPS and GIS technology to remap numerous house foundations and big horn hunting sites.

With our visits to various field projects completed, we will now fly back to home base, this time landing at the Columbus Avenue side of the Museum, and walk inside our Grand Gallery to view one of our newest and most superb specimens just recently put on display. This slice of rock is a subject of great research interest to our Earth Sciences Curator, George Harlow.

It's a remarkable example of jade in the rough. Jade, used as an ornamental stone for thousands of years, actually refers to two kinds of rock. The one shown here is jadeite, a silicate mineral rich in sodium and aluminum. The other kind, called nephrite, is rich in calcium and magnesium.

Jadeite jade is the rarer and generally the more valuable of the two. Jadeite jade is found in only a few regions of the world. This piece comes from northern Myanmar, formerly Burma. So the Museum scientists are still on the trek for marvelous specimens like our jadeite and the archaeological remains, marine creatures, insects, fish, and fossils we have seen in our brief tour here.

As I said earlier, exploration is a tradition going back to the very beginnings of the Museum. In many cases we have become users of sophisticated tools, CT scans, remote sensing, GPS, Google Earth, and even coronagraphs attached to some of the world's most powerful telescopes. In other cases the traditional hardships, uncertain weather, tough roads, and vehicle breakdowns persist.

But we, like our predecessors at the Museum, face these challenges with excitement and enthusiasm and with the conviction that the golden age of exploration is not over. Again, this is Michael Novacek of the American Museum of Natural History. I hope you enjoyed our globetrotting.