Jack Hoopes: Adventures of a veterinary pathologist

By Roger P. Smith, Ph.D.

But if I ran the zoo," said young Gerald McGrew, "I'd make a few changes, / That's just what I'd do . . ." was how Dr. Seuss described the feelings of an imaginary young friend in his 1950 classic, If I Ran the Zoo.

P. Jack Hoopes, D.V.M., Ph.D., may have had similar feelings in 1977, when he began an unusual two-year residency in exotic animal medicine and pathology at the National Zoological Park in Washington, D.C. Hoopes feels his training at the National Zoo—one of only a handful of the world's zoos with an intensive research program—played a key role in launching his academic career. Today, he's an associate professor of surgery (neurosurgery) and of medicine (radiation oncology) at DMS and the director of the Surgery, Radiation Oncology, and Bioengineering Research Laboratories at DHMC.

Back in Hoopes' zoo days, his research focused on the reproductive biology of rare and endangered species and on safely administering anesthesia to these animals. Using techniques such as cryopreservation of semen and in vitro fertilization—first tested in zebras, but now standard practices in animal husbandry as well as for human patients—he helped to perpetuate species as rare as the pygmy hippopotamus. But collecting sperm from animals, conducting other medical procedures on them, treating and diagnosing their illnesses, and recapturing ones that have escaped can be tricky and usually require that the animal first be anesthetized. Unfortunately, for many rare species there wasn't then—and still isn't—much good data on effective anesthetics and how to administer them.

Among Hoopes' many stories from his zoo days is one about the famous giant pandas—Ling-Ling and Hsing-Hsing—that were gifts to the United States from China in 1972. They were the zoo's most popular attraction for 20 years, until Ling-Ling died of old age in 1992, but their failure to produce offspring that survived more than a few days was one of the great disappointments of the international zoo community and of the National Zoo's regular visitors. Zoo officials finally decided that a gynecological and general physical examination of Ling-Ling, the female, might reveal the cause of the problem. Such an examination, however, would require anesthesia.

"Neither panda had ever been anesthetized before, and the literature contained almost nothing useful in the way of past experience," Hoopes explains. So he and his colleagues had to innovate. Ling-Ling was herded into a restraining cage. A syringe was attached to a pole that also served as the plunger, and then the syringe was loaded with what was, at the time, an experimental anesthetic. The drug was injected into Ling-Ling's hindquarters—the panda equivalent of the gluteus maximus.

"I was not the man in charge," says Hoopes, "but I certainly felt the pressure as much as anyone there. There was a certain chance of provoking an international incident if things did not go well."

Fortunately, the anesthesia and the subsequent procedures did come off smoothly, and the tests indicated that Ling-Ling was essentially normal. The problem seemed to lie with Hsing-Hsing, who was getting along in years.

Then there was the annual problem with the incontinent deer. At Christmas time, the zoo was responsible for one of the capital city's holiday traditions. A half-dozen "reindeer" (actually, Old World caribou) were transported to a special enclosure on the White House lawn for viewing by visiting dignitaries and the public. Every year, to the great discomfort of both zoo and White House officials, the animals would without fail develop profuse diarrhea shortly after their relocation to 1600 Pennsylvania Avenue. The reindeer, of course, were under the continuing care of the zoo staff, and no expense was spared in trying to alleviate their symptoms and diagnose the problem. It took several years for a bacterial or parasitic agent to be ruled out. Some pundits wondered whether the animals were expressing a political opinion. But, according to Hoopes, the cause turned out to be rather mundane—the reindeer were suffering from an excess of exotic holiday treats provided by a well-intentioned but ill-informed public.

Hoopes also tells the story of a potentially dangerous situation that occurred while he was working at the zoo—when a keeper inadvertently left open the door to a bear cage. A large European bear wandered out, directly into the midst of a group of zoo-goers, who mistook it for a trained animal act. While the bear was kept interested in snacks provided by the spectators, the zoo staff swung into action.

"The authorities have contingency plans for animal escapes," says Hoopes. "The plans at the National Zoo include a list of species that..."
Before Hoopes’s stint at the National Zoo, he attended Oklahoma University, earned his D.V.M. at Oklahoma State, and did an internship at a veterinary hospital in South Dakota. After his residency at the zoo, he went on to three more years of residency at Colorado State, while also earning a Ph.D. in pathology and radiation biology there. Then, after two additional years of postdoctoral training at North Carolina State and Duke, he came to DSM in 1988 as an assistant professor of medicine and of surgery and also as the acting director of the Animal Resource Center.

In his early years at DSM, Hoopes worked primarily on an NIH-funded project to determine the toxicity and efficacy of interstitial radiation and hyperthermia in the treatment of brain tumors. He has also collaborated on various other efforts, including mitigating radiation-induced heart damage by timing radiation to a specific part of the heart cycle; creating mathematical models for real-time prediction and assessment of brain movement during surgery; and studying the feasibility and efficacy of photodynamic therapy in the treatment of cancer and non-cancer diseases. “Jack has developed a well-deserved reputation as a can-do person,” says Richard Dow, M.D., chair of surgery. “He is both the grease and the glue for a large number of collaborative projects. Facilitators like Jack are often unsung, but are real heroes in the research environment.”

Since 1992, Hoopes has also been the director of the radiation biology research program at DSM, as well as director of the irradiation shared service and codirector of the radiation bioengineering research program, both at DHMC’s Norris Cotton Cancer Center (NCCC). Robert Greenberg, director of the NCCC, describes Hoopes as “an invaluable colleague for scientists working in cancer research.”

His work in the pathogenesis and moderation of radiation injury in the brain, for example, may lead to a better understanding of the cascade of adverse events that follow radiation therapy, as well as help to determine whether higher curative doses of radiation can be safely delivered to tumors that are surrounded by normal tissue.

Hoopes was named director of the Surgery, Radiation Oncology, and Bioengineering Laboratories in 1996 and continues to keep tabs on page 62.